F 3553

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Reg. No.....

Name.....

B.Com. (Model I) DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Common Course—ENGLISH

PERSPECTIVES IN LITERATURE

(2013—2016 Admissions)

Time : Three Hours

Maximum Marks : 80

Part A

Answer **all** *the following questions in a sentence or two.*
Each question carries 1 *mark.*

1. What will happen if a certain weekly ceases its publication according to E.V. Lucas ?
2. What is the occasion of the speech 'A Glory has Departed' ?
3. What is the 'task ahead' that Nehru mentioned in his speech ?
4. What was the mistake that Aristotle made ?
5. What is Ivan's outlook towards lottery and luck ?
6. What was the sudden commotion that was created in the bank ?
7. Why was the mother reluctant to see the film ?
8. What was the happy occasion in the story 'A Devoted Son' ?
9. Why were the author and his companion attracted to the boys ?
10. What is the gap that the poet refers to in the poem 'Mending Wall' ?

(10 × 1 = 10)

Part B

Answer any **eight** ***of*** *the following questions in about* 60 *words each..*
Each question carries 2 *marks.*

11. What are the different types of bores that Lucas mentions in the essay 'Bores' ?
12. How can we do our duty and pay proper homage to Gandhi ?

Turn over

13. How does Amartya Sen evaluate the practice of democracy in independent India ?

14. Many matters cannot be easily brought to the test of experience. Why ?

15. How does Keats contrast the permanence of the bird with the transience of human life ?

16. What causes the poet to question the mending of the wall ?

17. How does the bicycle become an agent of death ?

18. What prevents the poet from revealing the truth to the girl ?

19. When the story ends, how does Ivan reconcile with his situation ?

20. Ben Price knew Jimmy's habits. What were his habits ?

21. What do you think R.K. Narayan tried to convey through the story ?

22. What did Varma confide in his friend Bhatia ?

(8 × 2 = 16)

Part C

Answer any **six** ***of*** *the following questions in about* 100 *words each.*
Each question carries 4 *marks.*

23. How does the buttonholing bore behave ?

24. Why does Nehru feel that no monument is needed for Gandhi ?

25. Why does Amartya Sen say that educational progress is uneven in India ?

26. What effect does the nightingale's song produce on the poet ?

27. What does Robert Frost refer to as 'out-door game' in the poem 'Mending Wall' ?

28. How does Malouf give a mysterious air to the bicycle ?

29. How does Maya Angelou treat the themes of love and deception in 'Poor Girl' ?

30. What is the moral of the story 'A Retriewed Reformation' ?

31. What is the lesson Anita Desai trying to put across the story 'A Devoted Son' ?

(6 × 4 = 24)

Part D

Answer any **two** ***of*** *the following in about* 300 *words each.*
Each question carries 15 *marks.*

32. Discuss Amartya Sen's evaluation of India after fifty years of independence.

33. How does Keats establish a connection between pleasure and pain and life and death in the poem 'Ode to a Nightingale'.

34. Consider 'once upon a Time' as a poem on 'Cultural loss'. Also discuss the conflict between the past and the present in the poem.

35. Attempt a critical appreciation of 'The Lottery Ticket' as a study of human psychology.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.A DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Complementary Course—SANSKRIT I—POETRY AND GRAMMAR

(Common for B.A. Malayalam, Hindi and Music Programmes)

(2013 Admission onwards)

Time : Three Hours | Maximum Marks : 80

Answers may be written **either** *in Sanskrit* **or** *in English.*
In writing Sanskrit, Devanagari script should be used.

Part A

पदेन वाक्येन वा उत्तरं लिखत ।
Write in a word or a sentence each.

1 हरये अत्र विभक्ति: क: ?

What is the Vibhakti in हरये ?

2 अस्मद् शब्दस्य पञ्चमी एकवचनरूपं लिखत ।

Write the पञ्चमी एकवचनरूपं of अस्मद् ।

3 युष्मद्-शब्दस्य प्रथमाविभक्तौ एकवचने किं रूपम् ?

What is the एकवचनरूपं of युष्मद् in प्रथमाविभक्ति: ?

4 यक्षप्रश्नम् कस्मात् ग्रन्थात् गृहीत: ?

From which book is "Yakhaprasnam" taken ?

5 कर्मकारकविधायकं सूत्रं किम् ?

Which is the sutra that prescribes the कर्मकारकम् ?

Turn over

6 भूमे: गुरुतरा का ?

What is heavier than the earth ?

7 एध् धातो: लृट् प्रथमपुरुषे एकवचनरूपं किम् ?

What is the लृट् प्रथमपुरुष एकवचनरूपं of the root एध् ?

8 भू धातो: लृट् उत्तमपुरुषे बहुवचनरूपं किम् ?

What is the लृट् उत्तमपुरुष बहुवचनरूपं of the root भू ?

9 तपस: लक्षणं किम् ?

What is the definition of तपस् ?

10 सर्वभूतानां अतिथि: क: ?

Who is the guest of all beings ?

(10 × 1 = 10)

Part B

द्वित्रै: वाक्यै: अष्टानाम् उत्तरं लिखत ।

Answer in two **or** *three sentences each.*

11 संस्कृतभाषायां कति वचनानि सन्ति ? सोदाहरणं लिखत ।

How many Vachanas are there in the Sanskrit language ? Write them with examples.

12 गुरु, हरि, राम एतेषां शब्दानां चतुर्थीरूपाणि लिखत ।

Write the Chaturthi Vibhakti forms of the words Guru, Hari, and Rama.

13 षष्ठी विभक्तीनां अर्थभेदान् लिखत ।

Write the different meanings of the Shashti Vibhakti.

14 एध् धातो: लट् रूपाणि लिखत ।

Write the present tense forms of the root verb एध्.

15 अपादानकारकम् विशदयत ।

Explain अपादानकारकम्.

16. आधारोऽधिकरणम् विशदयत ।

Explain आधारोऽधिकरणम

17. कर्तुरीप्सिततमं कर्म विशदयत ।

Explain कर्तुरीप्सिततमं कर्म

18. भू धातो: लट् रूपाणि लिखत ।

Write the लट् रूपाणि of the root verb भू.

19. पैशुन्यं नाम किम् ?

What is meant by पैशुन्यम् ?

20. क्षमा नाम का ?

What is क्षमा ?

21. गणेशाय नम:—अत्र विभक्ति: का ? कुत: ?

In the sentence गणेशाय नम: which विभक्ति: is used and why ?

22. बुद्धिमान् क: ?

Who is considered a wise person ?

(8 × 2 = 16)

Turn over

Part C

खण्डिकया **षण्णां** उत्तराणि लिखत ।

Answer any **six** *in a paragraph.*

23. यक्षप्रश्नस्य प्रसक्तिं विशदयत ।

24. ब्राह्मण क्षत्रिययो: देवत्वादिं विशदयत ।

25. नकुलो यक्ष जीवतु—कुत: ?

26. एकं सुभाषितं तदर्थं च लिखत ।

27. चतुर्थी सम्प्रधाने—विशदयत ।

28. कर्तृकरणयोस्तृतीया—विशदयत ।

29. एध् धातो: लट् रूपाणि लिखत ।

30. कविशब्दरूपाणि लिखत ।

31. युष्मद् शब्दरूपाणि लिखत ।

(6 × 4 = 24)

Part D

द्वे उपन्यस्यत ।

Write any **two** *essays.*

32. भू धातो लट्, लङ्, लृट् रूपाणि लिखत ।

33. यक्ष—युधिष्ठिरसंवादो वर्णयत ।

34. सुभाषितानां प्रसक्तिमधिकृत्य विशदयत ।

35. राम, गुरु, अस्मद्—रूपाणि लिखत ।

(2 × 15 = 30)

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Reg. No.....

Name.....

B.A./B.Sc. (MODEL I) DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Additional Language—Hindi

POETRY AND FICTION

(2013–2016 Admissions)

Time : Three Hours | Maximum Marks : 80

Part A

एक या दो वाक्यों में उत्तर लिखिए ।

Each question carries 1 *mark.*

1. कबीरदास के वाणी का संग्रह किस नाम से प्रसिद्ध है ?
2. तुलसीदास के गुरु कौन थे ?
3. आदर्श विद्यालय का प्रिंसिपल कौन है ?
4. सेठ के बेटे पर किसका कोप हुआ ?
5. भारतीय ज्ञानपीठ पुरस्कार से प्राप्त अज्ञेयजी की कृति कौनसी है ?
6. निराला का पूरा नाम क्या है ?
7. धन्नी किस कहानी का पात्र है ?
8. बडे भाई किसका शिकार था ?
9. प्रेमचन्द के किन्हीं दो उपन्यासों का नाम लिखिए ।
10. बंटू ने गणित के अध्यापक को क्या कहकर पुकारा ?

(10 × 1 = 10)

Turn over

Part B

प्रत्येक खण्ड से कम से कम चार प्रश्न चुनकर कुल **आठ** प्रश्नों के उत्तर लिखिए ।

Each question carries 2 *marks.*

खण्ड (क)

11. तुलसीदास के किन्हीं चार रचनाओं के नाम लिखिए ।
12. कबीरदास के वाणी की विशेषताएँ लिखिए ।
13. 'खामोश' धड़कनें कविता में अभिव्यक्त संवेदना क्या है ?
14. कवि कहाँ नाच रहे हैं ?
15. 'सरोज-स्मृति' का परिचय दीजिए ।
16. प्रेमपत्र कविता का प्रतिपाद्य क्या है ?

खण्ड (ख)

17. घर पहुँचकर छोटे भाई ने माँ से क्या कहा ?
18. रामी ने धन्नी को क्यों बुलाया ?
19. प्रार्थना में भाग न लेने पर बंटू को क्या देड मिला था ?
20. मनोज कौन है ? उसके पिताजी की मृत्यू कैसे हुई ?
21. अपर्णा मिस के चरित्रगत विशेषताएँ क्या-क्या है ?
22. श्रीविलास केलिए होली का दिन भीष्णतम दिन है । क्यों ?

$(8 \times 2 = 16)$

Part C

प्रत्येक खण्ड से कम से कम तीन प्रश्न चुनकर कुल **छः** प्रश्नों के उत्तर लिखिए ।

Each question carries 4 *marks.*

खण्ड (क)

23. सप्रसंग व्याख्या कीजिए :

"गोधन गज धन बाजि धन और रतन धन खान ।
जब आवै संतोष - धन, सब धन धूरि समान ।।"

24. सप्रसंग व्याख्या कीजिए :

''साधु भूखा भाव का, धन का भूखा नाहिं ।

धन का भूखा जो फिरै, सो तो साधू नाहिं ।''

25. ''धन्ये मैं पिता निरर्थक था,

कुछ भी तेरे हित न कर सका ।''—सप्रसंग व्याख्या कीजिए

26. प्रलय के दिनों में सप्ता मछली और मनु

सब वेद बचायेंगे

कोई नहीं बचायेगा प्रेमपत्र ।''—व्याख्या कीजिए ।

27. सप्रसंग व्याख्या कीजिए :

''सुनो, हमें अनहद की तरह

और समझो जैसे समझी जाती है

नई-नई सीखी हुई भाषा ।''

खण्ड (ख)

28. मनोज ने कप्तान से बंटू की क्या शिकायत दी ? और क्यों दी ?

29. बंटू को सारे लड़कों के सामने कवायद करनी पड़ी क्यों ?

30. बडे भाई के प्रति छोटे भाई के मन में प्रतिकार की भावना क्यों उत्पन्न हुई ?

31. रानी माँ का चबूतरा क्यों बनाया गया ?

$(6 \times 4 = 24)$

Turn over

Part D

किन्हीं **दो** प्रश्नों के उत्तर लिखिए ।

Each question carries 15 *marks.*

32. उपन्यास कला की दृष्टि से अकेली आवाज़ उपन्यास की समीक्षा कीजिए ।

33. पढित कहानी के आधार पर प्रेमचन्द की कहानियों की विशेषताएँ लिखिए ।

34. 'प्रेमपत्र' कविता का सारांश अपने शब्दों में लिखकर उसकी विशेषताओं पर प्रकाश डालिए ।

(2 × 15 = 30)

F 3556

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Reg. No.....

Name.....

B.A. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Additional Language—Arabic

QURAN AND HADITH TEXTS

[For Model I B.A./B.Sc. and Model II B.A. Arabic Programmes]

Time : Three Hours

Maximum Marks : 80

PART A

* أجب في جملة واحدة عن الأسئلة الآتية حسب الارشادات :

(10X1=10)

1- ما ضدّ كلمة "الرضى" ؟

2- مِمّ خلق الإنسان ؟

3- "هل يسمعونكم إذ تدعون" من قال ؟

4- "وجعل بينكم مودّة ورحمة" بين من ؟

5- ما هي السّورة التي سميت باسم دولة وقت نزول القرآن ؟

6- "إنّها سائت مستقرّا ومقاما" ماهي ؟

7- أكمل الحديث :

المظلم ظلمات .....

8- كمّل الآية :

ثم إنّكم يوم القيامة .....

9- وجعلنا للمتقين .....

(كراما - قواما - إماما)

10- أنظروا إلى من هو ..... منكم

(أكبر - أسفل - أصغر)

PART-B-

* أجب عن ثمانية من الآتية حسب الإرشادات : (8x2=16)

11- "يضاعف له العذاب يوم القيامة" لمن ؟

12- كيف يأكل الحسد الحسنات ؟

13- من هو الشديد على ضوء الحديث ؟

14- ما هو الإثم والبرّ ؟

* رتب الكلمات حتى تصير جملة صحيحة :

15- يفعلون / وجدنا / كذلك / قالوا / آباءنا / بل

16- مكين / قرار / جعلناه / في / ثم

17- لا / مال / ولا / ينفع / يوم / بنون

* كمّل بالكلمات المناسبة :

18- إنّ أخوف ما أخاف عليكم .....

19- حق المسلم على المسلم .....

20- ولتنظر نفس ما قدّمت .....

21- وله من في السموات والأرض كلّ له .....

22- إلاّ من أتى الله بقلب .....

PART- C-

* أجب عن ستة من الآتية مفصّلا : (6x4=24)

23- دعاء إبراهيم عليه السلام كما جاء في سورة الشعراء

24- آداب السلام

25- حق المسلم على المسلم. 26- إبن حجر العسقلاني

27- مراحل خلق الإنسان كما ورد فى سورة "المؤمنون".

28- المنافقون

29- أذكر بعض آيات الله كما جاء فى سورة "الرّوم"

30- عقوق الأمّهات و وأد البنات

31- الحديث وأهمية

PART-D

* أكتب مقالة عن اثنين من الآتية : (2x15=30)

32- إعجاز القرآن

33- المؤمنون المفلحون

34- عباد الرحمن

35- "يا أيّها الذين آمنوا اتّقوا الله و لتنظر نفس ما قدّمت لغدٍ واتقوا الله إنّ الله خبير بما تعملون" فسّر الآية.

F 3557

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Reg. No.....

Name.....

B.Com. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Core Course IX—BUSINESS MANAGEMENT

[Common for Model I, Model II and U.G.C. Sponsored B.Com. Degree Programs]

(2013—2016 Admissions)

Time : Three Hours Maximum Marks : 80

Answers may be written **either** *in English* **or** *in Malayalam.*

Part A (Short Answer Questions)

Answer **all** *questions.*
Each question carries 1 *mark.*

1. State any *four* characteristics of management.
2. Explain management as a profession.
3. What is meant by Scalar Chain ?
4. State any *four* principles of F.W. Taylor.
5. What is meant by planning premises ?
6. Define strategic planning.
7. What is decentralization ?
8. What do you mean by manpower planning ?
9. Define democratic leadership.
10. What is a control standard ?

(10 × 1 = 10)

Turn over

Part B (Brief Answer Questions)

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. Define social responsibility of business.
12. Explain Henri Fayol's contribution to management.
13. What is contingency planning ? State its importance.
14. Explain the relationship between planning and decision making.
15. Distinguish between responsibility and authority.
16. What are the principles of effective delegation ?
17. Briefly explain the internal sources of recruitment.
18. Explain the factors affecting staffing decisions.
19. What is meant by positive motivation ? Explain its importance.
20. What is Herzberg's Two-Factor Theory ? Explain.
21. What is meant by management by exception ?
22. What is management audit ? Explain its advantages.

$(8 \times 2 = 16)$

Part C (Short Essays)

Answer any **six** *questions.*
Each question carries 4 *marks.*

23. Explain the differences between administration and management.
24. How does planning help in achieving organizational objectives ?
25. What are the major steps involved in effective planning ?
26. Define organization chart. Explain its importance and uses.
27. What is Centralization ? Explain its advantages and disadvantages.
28. Explain the role of interview and reference checks in employee selection.
29. Discuss McGregor's Theory X and Theory Y.

30. What is participative leadership? Explain its importance.

31. Discuss budgetary control as a method of managerial control.

(6 × 4 = 24)

Part D (Essays)

Answer any **two** *questions.*
Each question carries 15 *marks.*

32. Discuss the nature, scope and importance of management.

33. Define MBO and explain its characteristics, process and advantages.

34. Explain the transformational and transactional leadership styles.

35. Explain Maslow's Need Hierarchy Theory of Motivation.

(2 × 15 = 30)

F 3558

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Reg. No.....

Name.....

B.Com. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Core Course VII—MARKETING MANAGEMENT

[Common for Model I, Model II and U.G.C. Sponsored B.Com. Degree Programs]

(2013—2016 Admissions)

Time : Three Hours Maximum Marks : 80

Part A (Short Answer Questions)

Answer **all** *questions.*
Each question carries 1 *mark.*

1. Define Marketing.
2. Distinguish between marketing and selling.
3. Explain the concept of 4 Ps of marketing mix.
4. What is market targeting ?
5. Define consumer behaviour.
6. What is meant by white goods ?
7. Define brand equity.
8. Distinguish between inbound and outbound logistics.
9. Define virtual marketing.
10. What is meant by direct marketing ?

(10 × 1 = 10)

Turn over

Part B (Brief Answer Questions)

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. What is marketing management ? Explain its importance.
12. Discuss the factors influencing marketing mix decisions.
13. What is meant by market positioning ?
14. What is a patronage buying motive ?
15. What are the objectives of labelling ?
16. What is meant by product innovation ?
17. Distinguish between skimming pricing and penetration pricing.
18. Who are the major intermediaries in distribution ?
19. What are the main components of logistics ?
20. What are the different types of demarketing ?
21. Define service marketing and explain its importance.
22. Distinguish between social marketing and commercial marketing.

$(8 \times 2 = 16)$

Part C (Short Essays)

Answer any **six** *questions.*
Each question carries 4 *marks.*

23. "Modern marketing starts and ends with the customer". Briefly discuss.
24. Define marketing mix. Explain its various components.
25. Explain the methods of sustaining customer relationship.
26. Explain the process of market segmentation.
27. Define sales promotion. Differentiate between sales promotion and advertising.
28. Briefly explain the different stages of Product Life Cycle.
29. Discuss the importance of physical distribution in marketing.

30. Explain the factors affecting pricing decisions of services.

31. Discuss the objectives and benefits of relationship marketing.

(6 × 4 = 24)

Part D (Essays)

Answer any **two** *questions.*
Each question carries 15 *marks.*

32. Explain the relationship between marketing management and customer satisfaction.

33. Explain the various branding strategies adopted by modern business organizations.

34. What is psychological pricing ? Explain its importance and various methods.

35. Explain the various tools and techniques of e-marketing.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.Com. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Core Course VIII—FINANCIAL ACCOUNTING

[Common for Model I, Model II and U.G.C. Sponsored B.Com. Degree Programs]

(2013—2016 Admissions)

Time : Three Hours Maximum Marks : 80

Part A (Short Answer Questions)

Answer **all** *questions.*
Each question carries 1 *mark.*

1. What is the business entity concept ?
2. What is a contingent liability ?
3. Explain the importance of consistency in accounting.
4. What is an Accounting Standards ?
5. Distinguish between capital and revenue expenditure.
6. What is a statement of affairs ?
7. What is meant by minimum rent ?
8. What is an independent branch ?
9. What is branch stock reserve ?
10. What is meant by pro forma invoice ?

(10 × 1 = 10)

Part B (Brief Answer Questions)

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. What is meant by Accounting Convention ? Explain any *two* accounting conventions.
12. What are the objectives of preparing a Balance Sheet ?

Turn over

13. Explain the accounting treatment of goods withdrawn by the proprietor for personal use.

14. Give rectifying entries in respect of the following transactions.

    a) Purchase of furniture was debited to Purchase Account Rs. 2,500.

    b) Rs. 500 received from Sharma posted to Varma's account.

    c) Repair of machinery was debited to machinery account Rs. 890.

    d) Goods sold on credit was recorded twice Rs. 1,500.

15. What do you mean by grouping and marshalling of assets and liabilities ?

16. Mr. X started a small retail shop, on 1st January 2025 with cash Rs. 4,000, Building Rs. 30,000 and furniture Rs. 10,000. On 31st December 2025, he had cash in hand Rs. 3,000, cash at bank Rs. 7,500, Stock in trade Rs. 8,900, sundry debtors Rs. 12,000, Computer Rs. 15,000, furniture Rs. 7,000 and sundry creditors 9,000. During the year he withdrew Rs. 6,000 for personal purpose and brought in Rs. 2,000 from private property. Ascertain the profit or loss of Mr. X for the year ended 31st December 2025.

17. Ascertain the credit purchases from the transactions :

		Rs.
Bills payable at beginning	...	30,000
Creditors at beginning	...	90,000
Cash paid for bills payable	...	85,000
Cash paid to creditors	...	2,25,000
Discount allowed by creditors	...	7,000
Purchase returns	...	8,000
Bills payable at the end	...	42,000
Creditors at the end	...	74,000

18. Define financial accounting. Explain its objectives.

19. Distinguish between Branch Account and Branch Profit and Loss Account.

20. From the following particulars, prepare the Branch Account and Branch Debtors Account.

    Opening debtors Rs. 30,000,

    Credit sales Rs. 1,45,000,

    Cash received from debtors Rs. 90,000,

    Return inwards Rs. 5,000,

    Bad debts Rs. 3,000,

    Closing debtors Rs. 52,000.

21. Explain the accounting treatment of 'load' in consignment.

22. Goods costing Rs. 4,00,000 are sent to a consignment at an invoice price of Rs. 5,00,000. The consignor incurred an expenses of Rs. 5,000. The consignee sells 75 % of goods for Rs. 4,75,000 and is entitled to 5 % commission. Calculate :

    a) Value of closing stock ; and

    b) Profit on consignment.

(8 × 2 = 16)

Part C (Short Essays)

Answer any **six** *questions.*
Each question carries 4 *marks.*

23. What are adjusting and closing entries ? Why they are needed ?

24. Discuss the merits and demerits of Accounting Standards.

25. On 1st January 2024, the provision for Bad Debts Account showed a credit balance of Rs. 3,600. During the year the bad debts amounted to Rs. 2,800. The debtors on 31st December 2024 amounted to Rs. 96,000 and a provision of 5% for Doubtful Debts was maintained.

    In 2025, the Bad Debts amounted to Rs. 1,200 and the Debtors at the end of the year amounted to Rs. 50,000, on which a provision of 5 % for Bad Debts to be maintained. Show for the years 2024 and 2025 :

    i) Provision for Bad Debts Account

    ii) How the relevant items will appear in the Profit and Loss Account and Balance Sheet ?

Turn over

26. Define single entry system. Explain the different types of accounts maintained under this system.

27. What is abnormal loss ? Explain how abnormal loss is calculated and recorded in the books of the consignor ?

28. Explain the materiality convention with suitable examples.

29. Rana Enterprises, Trivandrum, has a branch at Ernakulum to which goods are invoiced at cost plus 30 %. The following are the transactions between the Head Office and the Branch for the year ending 31-12-2025.

    Stock at the branch on 1-1-2025 Rs. 13,000

    Sundry debtors on 1-1-2025 Rs. 25,000

    Petty cash on 1-1-2025 Rs. 12

    Goods sent to branch Rs. 65,000

    Total sales during the year Rs. 1,10,000

    Cash sales Rs. 85,000

    Cash received from branch debtors Rs. 42,000

    Expenses incurred by the branch for the year Rs. 11,500

    Branch stock on 31-12-2025 Rs. 52,000

    Petty cash on 31-12-2025 Rs. 65

    Pass the necessary journal entries and also show how the Branch Account will appear in the books of the Head Office.

30. A lease provides for royalty at Rs. 8 per tonne, with a minimum rent of Rs. 80,000 per year. The minimum rent is reduced proportionately if production is stopped due to strike. Short workings are recoupable within two years.

    Production :

    Year 1—6,000 tonnes, Year 2—5,000 tonnes, Year 3— 12,000 tonnes and Year 4—15,000 tonnes.

    During the year 2, there was a strike for 3 months.

    Calculate the amount payable to the lessor for each year

31. Explain the double-entry system of accounting and its basic principles.

(6 × 4 = 24)

Part D (Essays)

Answer any **two** *questions.*
Each question carries 15 *marks.*

32. Following balances are extracted from the books of John, who keeps incomplete records of his transactions.

	1st January 2025	31st December 2025
	Rs.	Rs.
Stock	2,400	3,000
Debtors	4,000	3,200
Creditors	1,700	3,900
Cash in hand	2,000	3,800
Bank overdraft	2,400	—
Furniture and Fittings	800	1,000
Motor Bike	9,500	9,500
Bills Receivable	2,000	4,300

Drawings during the year amounted to Rs. 2,800. Depreciate furniture and fittings @ 5 % and write off Rs. 500 on Motor Bike. Rs. 100 is irrecoverable and a further provision of 5 % for doubtful debts are to be provided. Further, a provision of Rs. 200 in respect of bills are also to be provided. Ascertain the profit or loss for the year ended 31st December 2025 and prepare a Statement of Affairs as on that date.

33. A consignment of 10,000 kg of tea, costing Rs. 50 per kg, sent on consignment on 1st February 2024 to an agent, on commission of 5% on gross sales. The following expenses are incurred :

a) By the Consigner : Freight and insurance Rs. 2,000 and dock charges and sundry expenses Rs. 800.

b) By the Consignee : Godown rent and insurance Rs. 800 and miscellaneous expenses Rs. 1,400.

Some packages containing 2,000 kg of tea were damaged in transit and the contents had to be destroyed on landing as having become unfit for sale. 7,000 kg of tea were sold at Rs. 60 per kg and on 28th February 2024, the date of closing of accounts, the balance of the consignment remained unsold in stock. Prepare necessary accounts in the books of the Consignor.

Turn over

34. From the following Trial Balance of a trader you are required to prepare trading and profit and loss account for the year ending 31st December 2025 and a Balance Sheet as on that date :

Particulars	Dr. Rs.	Cr. Rs.
Cash in hand	10,000	
Cash at bank		3,000
Stock	35,000	
Debtors and Creditors	1,90,000	58,000
Drawings	51,300	
Salaries	18,000	
Purchases and sales	8,12,000	9,28,000
Wages	72,000	
General expenses	54,700	
Commission	3,000	
Furniture	40,000	
Goodwill	30,000	
Capital		3,27,000
	13,16,000	13,16,000

Adjustments :

a) Depreciate furniture by 10 %.

b) Private purchase amounting to Rs. 3,500 were passed through the purchase day book.

c) Wage outstanding Rs. 3,800 and Salary paid in advance Rs. 4,800.

d) Create a reserve for doubtful debts at 5 %.

e) Provide for 6 % interest on capital.

f) Annual insurance premium of Rs. 4,800 not yet paid.

g) Stock at the end was valued at Rs. 45,000. In view of the constant fall in prices, it has been decided to write off stock by 10 %.

35. Explain the various methods of accounting for dependent branches.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.Com. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

FINANCIAL MANAGEMENT

[Common for (1) Model I B.Com. Optional Stream Finance and Taxation. (2) Model II B.Com. Optional Stream Finance and Taxation and U.G.C. Sponsored Programmers, (3) Computer Applications, (4) Travel and Tourism, (5) Taxation]

(2013—2016 Admissions)

Time : Three Hours | Maximum Marks : 80

Part A (Short Answer Questions)

Answer **all** *questions.*
Each question carries 1 *mark.*

1. Define financial management.
2. What is meant by wealth maximization ?
3. What is the time value money ?
4. State any *four* advantages of debt capital.
5. Define cost of capital.
6. What is optimum capital structure ?
7. What is financial leverage ?
8. Distinguish between Gross Working Capital and Net Working Capital
9. What is meant by stock dividend ?
10. State any *four* advantages of stable dividend policy.

(10 × 1 = 10)

Turn over

Part B (Brief Answer Questions)

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. Explain the concept of compounding and discounting.
12. Calculate the present value of annual cash flow of Rs. 20,000 for five years at 12 %.
13. What is the cost of retained earnings ?
14. What is the significance of WACC ?
15. What is the Net Operating Income Approach ?
16. State the main assumptions of the MM theory.
17. What do you mean by operating cycle ?
18. What are bonus shares ? Explain their advantages.
19. A company has an EPS of Rs. 20, a DPS of Rs. 8, rate of return on investment of 15 %, and cost of equity of 12 %. Calculate the market price per share using Walter's model.
20. Distinguish between ordinary shares and right shares.
21. Discuss the importance of working capital management.
22. A company issues 10 % debentures of Rs. 1,000 each at Rs. 950. Tax rate is 30 % . Calculate cost of debt before and after taxes.

(8 × 2 = 16)

Part C (Short Essays)

Answer any **six** *questions.*
Each question carries 4 *marks.*

23. Discuss the major functions of financial management.
24. Explain the utility of retained earnings as a source of finance.
25. Explain the methods of computation of cost of equity capital.
26. Briefly discuss the factors affecting the capital structure of a company.
27. Discuss the relationship between leverage and business risk.

28. From the following information, calculate Operating,

    Financial and Combined Leverages.

    Sales 20,000 units @ Rs. 20 per unit.

    Variable cost Rs. 12 per unit.

    Fixed operating cost Rs. 60,000.

    Interest Rs. 30,000.

29. Explain the concept of arbitrage process under MM theory.

30. Briefly discuss the sources of working capital finance.

31. What are the different forms of dividend ? Explain.

(6 × 4 = 24)

Part D (Essays)

Answer any **two** *questions.*
Each question carries 15 *marks.*

32. Explain the changing role of a financial manager in modern business. Discuss in detail.

33. Explain the various factors determining the working capital requirements of a business enterprise.

34. Explain Walter's Model of dividend policy. State its assumptions, formula and limitations.

35. A company has the following sources of finance :

    a) 10,000 equity shares of Rs.100 each. Market price Rs. 120. Expected dividend Rs.12 per share. Growth rate 5 %.

    b) 2,000 preference shares of Rs. 100 each carrying 10 % dividend, issued at Rs. 95.

    c) Rs. 5,00,000 debentures carrying 12 % interest, issued at par.

    d) Corporate tax rate 40 %

    Calculate : 1. Cost of equity ; 2. Cost of preference shares ; 3. Cost of debt after tax ; and 4. WACC using market value weights.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.Com. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Core Course III—E-COMMERCE AND GENERAL INFORMATICS

[Common for Model I, Model II and U.G.C. Sponsored B.Com. Degree Programs]

(2013—2016 Admissions)

Time : Three Hours Maximum Marks : 80

Part A (Short Answer Questions)

Answer **all** *questions.*
Each question carries 1 *mark.*

1. Define e-commerce.
2. What is W3C ?
3. What is web server ?
4. Define value chain integration.
5. What is Info-mediary model ?
6. State any four advantages of mobile banking.
7. Define cyber cash.
8. What is face scanner ?
9. What is PGP ?
10. Define website promotion.

(10 × 1 = 10)

Turn over

Part B (Brief Answer Questions)

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. Explain the basic process of an e-commerce transaction.
12 Write a brief note on SCM.
13. Explain B2G.
14. What is utility model ?
15. What is aggregator models of e-commerce ?
16. What is push marketing model ?
17. What is tricking the shopper ?
18. What is meant by digital signature certification ?
19. What is payment gateway ?
20. What is meant by mobile payment ?
21. What is loyalty building in e-commerce ?
22. What is search engine marketing (SEM) ?

(8 × 2 = 16)

Part C (Short Essays)

Answer any **six** *questions.*
Each question carries 4 *marks.*

23. Briefly discuss the major areas covered by e-commerce.
24. Explain the role of B2B e-commerce in corporate purchasing.
25. Distinguish between traditional marketing and e-marketing.
26. What is online advertising ? Explain its merits and demerits.
27. What is Biometrics ? Which are the biometric devices and system ?
28. Discuss the various threats and risks to information security.
29. Explain electronic cheque payment system.

30. Explain the role of P2P payments systems in e-commerce.

31. Discuss the various methods of product delivery used in e-commerce.

(6 × 4 = 24)

Part D (Essays)

Answer any **two** *questions.*
Each question carries 15 *marks.*

32. "E-marketing has transformed traditional direct marketing and selling". Discuss the statement.

33. Explain the importance of data security and privacy in information systems.

34. Explain the role of internet banking and mobile banking in modern banking.

35. "E-commerce is the future of modern business." Elucidate the statement.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Complementary Course—ADVANCED INORGANIC AND ORGANIC CHEMISTRY

(For Students who have opted Biological Science and Family and Community Science as main)

[2013—2016 Admissions]

Time : Three Hours Maximum Marks : 60

Section A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. What is disintegration constant ?
2. What is the use of pyrethrin ?
3. What are bio-fertilizers ? Give an example
4. What is the function of Ferredoxine ?
5. Discuss the aromaticity of furan.
6. Discuss any one method of preparation of furan
7. What are tranquillizers ? What is its use ?
8. What are the main artificial sweeteners used ?

(8 × 1 = 8)

Section B

Answer any **six** *questions.*
Each question carries 2 *marks.*

9. What is half-life period ? What is its importance ?
10. What is carbon dating ? What is its use ?
11. What are nuclear reactors ? Discuss their uses.
12. Discuss the role of micronutrients.

Turn over

13. Distinguish between exergonic and endergonic reactions

14. How pyrimidine is prepared ? Discuss its properties

15. Discuss the chemistry of photophosphorylation

16. Give an example of a biological oxidation reaction

17. What is drug addiction abuse? How to prevent it ?

18. What are emulsifying agents ? Why is it required ?

(6 × 2 = 12)

Section C

Answer any **four** *questions.*
Each question carries 4 *marks.*

19. With suitable examples, discuss the different types of radioactivity.

20. Explain the applications of radioisotopes in medicine and in agriculture.

21. Illustrate the structure and function of 2,4,-D and 2,4,5 -T.

22. Make a comparison between photosynthesis and respiration.

23. Describe the preparation, structure and properties of indole.

24. Explain the applications of antibiotics and sulpha drugs.

(4 × 4 = 16)

Section D

Answer any **two** *questions.*
Each question carries 12 *marks.*

25. Explain the various types of nuclear reactions.

26. Explain the method of preparations and uses of DDT and BHC

27. Explain the general functions of hemoglobin.

28. Explain any one the method of preparations and uses of pyridine and purine.

(2 × 12 = 24)

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Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Course—FUNDAMENTALS OF ORGANIC CHEMISTRY

(Common for the Programmes of B.Sc. Chemistry Model I and Model II, B.Sc. Petrochemicals, B.Sc. Chemistry Environment and Water Management)

[2013—2016 Admissions]

Time : Three Hours Maximum Marks : 60

Section A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. Discuss the IUPAC naming of carbonyl compounds.
2. What is Markownikkof 's rule ?
3. What is Walden Inversion ?
4. What are the various conformations of cyclohexane ?
5. What are the methods used to distinguish geometrical isomerism ?
6. Discuss the aromaticity of tropylium cation.
7. What is resonance? What is its importance ?
8. What is Claisen Rearrangement ?

(8 × 1 = 8)

Section B

Answer any **six** *questions.*
Each question carries 2 *marks.*

9. Distinguish between Hoffmann and Satzeff's rules
10. What is hyper conjugation effect ? Give an example.

Turn over

11. What are carbanions ? Discuss any two methods of formation of carbanions.

12. Discuss the effects of solvents and leaving groups on the reactivity of nucleophilic aliphatic substitution reactions.

13. Discuss the Cahn - Ingold - Prelog rules.

14. Discuss the isomerism occurs in substituted biphenyls.

15. What is racemization? Discuss the methods used for racemization.

16. Discuss the mechanism of Friedel Craft's acylation and alkalization reactions.

17. Discuss the bimolecular displacement mechanism.

18. Discuss the stereochemical aspects of pericyclic reactions.

(6 × 2 = 12)

Section C

Answer any **four** *questions.*
Each question carries 4 *marks.*

19. Explain the rules of IUPAC nomenclature of different classes of organic hydrocarbon compounds.

20. Compare S_N1 and S_N2 and reaction mechanisms.

21. Describe the geometrical isomerism in maleic and fumaric acids.

22. What is Hukel's rule ? Discuss its applications.

23. Discuss the mechanisms of ring activation and deactivation of benzene by nitro, carbonyl and amino groups.

24. With suitable examples, explain different types of pericyclic reactions.

(4 × 4 = 16)

Section D

Answer any **two** *questions.*

Each question carries 12 *marks.*

25. With suitable examples, explain the different types of polymerization reactions.

26. What is resolution ? Explain the various methods of resolution of stereoisomers.

27. Using molecular orbital diagrams, discuss the structures of naphthalene and antharacene.

28. (a) Discuss the factors that determine whether an organic reaction follows elimination or substitution

    (b) What are the conditions for showing optical activity ?

    (c) Illustrate the reactivity and orientation in aromatic nucleophilic substitution reactions.

(2 × 12 = 24)

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Reg. No.....

Name.....

B.B.A./B.B.M. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Common Course—ENTREPRENEURSHIP

(Common for B.B.A. and B.B.M.)

[2013—2016 Admissions]

Time : Three Hours | Maximum Marks : 80

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. Define the term "Entrepreneurship".
2. Who is a Fabian entrepreneur ?
3. What is NIESBUD ?
4. What is venture capital ?
5. What is industrial sickness ?
6. What is project formulation ?
7. What is project identification ?
8. What is Small Scale Industry ?
9. What is support system ?
10. What is bridge finance ?

(10 × 1 = 10)

Turn over

Part B

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. Distinguish between Entrepreneur and Intrapreneur.

12. State the phases of EDP.

13. Mention the sources of project ideas.

14. Write a note on venture capital.

15. What are the objectives of Project Report ?

16. Mention the symptoms of sickness in SSIs.

17. What are the sources of working capital?

18. State the characteristics of a project.

19. Mention the advantages of a Small Scale business unit.

20. Give the functions of DIC.

21 .What is project appraisal ?

22. What is the need for EDP ?

(8 × 2 = 16)

Part C

Answer any **six** *questions.*
Each question carries 4 *marks.*

23. Discuss the qualities of a successful entrepreneur.

24. Explain the characteristics of entrepreneurship.

25. Discuss the objectives and significance of EDP.

26. What are the contents of a project report ?

27. What are the causes of sickness in Small Scale business units ?

28. Explain the various sources of fixed capital requirements available to entrepreneurs.

29. Enumerate the basic problems of women entrepreneurs in India.

30. Explain clearly the process of project identification.

31. Explain the main function of an entrepreneur.

(6 × 4 = 24)

Part D

Answer any **two** *questions.*
Each question carries 15 *marks.*

32. Explain the role of entrepreneurship in economic development.

33. Describe the various steps to be taken by an entrepreneur to start a small scale industrial unit.

34. Explain the various factors influencing entrepreneurship development.

35. Explain the institutional setup for providing finance to entrepreneurs in India.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.B.A. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Complementary Course—BUSINESS LAWS

(2013—2016 Admissions)

Time : Three Hours | Maximum Marks : 80

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. Define Offer.
2. What is meant by Acceptance ?
3. What is an illegal agreement ?
4. Who is a minor ?
5. Define Indemnity.
6. What is Guarantee ?
7. Define Bailment.
8. What is Pledge ?
9. Who is an unpaid seller ?
10. What is meant by Caveat Emptor ?

(10 × 1 = 10)

Turn over

Part B

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. What are the rules for a valid offer ?

12. What are the conditions for valid acceptance ?

13. What are the various kinds of consideration ?

14. Explain void and voidable contracts.

15. What is meant by supervening impossibility ?

16. What is a continuing guarantee ?

17. Distinguish between general lien and particular lien.

18. What is agency by ratification ?

19. What is meant by sub-agency ?

20. What is meant by right of stoppage in transit ?

21. Who is an unpaid seller ?

22. What is an auction sale ?

(8 × 2 = 16)

Part C

Answer any **six** *questions.*
Each question carries 4 *marks.*

23. Explain the essential features of consideration.

24. What are the differences between coercion and undue influence ?

25. What constitutes misrepresentation ?

26. Explain the essentials of a contract of guarantee.

27. Explain the nature and extent of surety's liability.

28. Explain the duties of a bailor and bailee.

29. Explain the different ways of creating agency.

30. Explain the classification of agents.

31. Distinguish between condition and warranty under the Sale of Goods Act.

(6 × 4 = 24)

Part D

Answer any **two** *questions.*
Each question carries 15 *marks.*

32. Explain the essentials of a valid contract under the Indian Contract Act, 1872.

33. What are the different modes of discharge of a contract ? Explain.

34. Enumerate the duties and rights of bailor and bailee in a contract of bailment.

35. Explain the general rule that no one can give a better title than he himself has. Discuss the exceptions to this rule.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.B.A. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Complementary Course—RESEARCH METHODOLOGY

(2013—2016 Admissions)

Time : Three Hours Maximum Marks : 80

Part A

Answer **all** *questions.*
Each question carries 1 *marks.*

1. Write meaning of Research process.
2. Write meaning of Applied research.
3. Write meaning of Review of Literature.
4. Write meaning of Pilot study.
5. Write meaning of Research design.
6. Write meaning of Sampling design.
7. Write meaning of Primary data.
8. Write meaning of Secondary data.
9. What is a popular report ?
10. What is the layout of a report ?

(10 × 1 = 10)

Part B

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. State the steps to be followed in a research process.
12. What are the features of fundamental research ?

Turn over

13. What are the techniques of defining research problem ?

14. State the features of snow ball sampling.

15. What are the various elements of research design ?

16. What is Multi-stage sampling technique ?

17. Why does sampling error occur ?

18. Under what circumstances stratified random sampling design is considered appropriate.

19. Explain the steps in drafting reports.

20. State the importance of oral presentation of research report.

21. Distinguish between research methods and research methodology.

22. Define empirical research.

(8 × 2 = 16)

Part C

Answer any **six** *questions.*
Each question carries 4 *marks.*

23. Examine the various types of research and their relative merits and demerits.

24. What are the characteristics of good questionnaire ?

25. Explain various source of research problem.

26. Explain the advantages of primary data.

27. What are the differences between Interview schedule and Questionnaire ?

28. What is Hypothesis ? Explain its importance in research.

29. Explain the factors to be considered while deciding sample size.

30. Explain various types of research reports.

31. Highlight the Layout of a research report.

(6 × 4 = 24)

Part D

Answer any **two** *questions.*
Each question carries 15 *marks.*

32. What is meant by Research ? Explain its objectives and significance.

33. Explain the meaning, significance and features of a research design.

34. What is secondary data? Explain it's sources, merits and demerits.

35. Explain the significance of a research report and narrate the steps involved in writing a report.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.B.A. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Core Course – CORPORATE ACCOUNTING

(2013–2016 Admissions)

Time : Three Hours Maximum Marks : 80

Part A

Answer **all** *questions.*
Each question carries 1 mark.

1. What is a Preference Share ?
2. What is meant by forfeiture of shares ?
3. What is a Convertible Debenture ?
4. What is Goodwill ?
5. What is meant by Interim Dividend ?
6. What is Subscribed Capital ?
7. What is a Depository ?
8. What is Profit and Loss Appropriation Account ?
9. What is a Non-Performing Asset ?
10. What is Rebate on Bills Discounted ?

(10 × 1 = 10)

Part B

Answer any **eight** *questions.*

Each question carries 2 marks.

11. What is meant by buy-back of equity shares ?
12. What is Book Building ?
13. What are the rules for Bonus Issue ?
14. Explain :

    (i) Calls in Advance ; and (ii) Calls in Arrear.

15. What is meant by pro-rata allotment ?
16. Distinguish between ex-interest price and cum-interest price.
17. What is meant by Super Profit ?
18. State the factors determining the value of goodwill of a company.
19. What are the various classifications of investments by a banking company ?
20. State the procedure for redemption of preference shares.
21. State the importance of Schedule I and Schedule II of the bank's balance sheet.
22. What are the facilities offered by the depository system ?

(8 × 2 = 16)

Part C

Answer any **six** *questions.*

Each question carries 4 marks.

23. Explain the different kinds of preference shares.
24. Explain the various methods of valuation of shares and goodwill.
25. What is a Bonus Share ? What are the circumstances in which bonus shares are generally issued ? What profits can be used for such an issue ?
26. Explain the various methods of redemption of debentures.
27. Explain the classification of assets in banks.
28. Lakshmi Company Ltd. proposes to issue 10,000,14% Debentures of Rs. 100 each to its shareholders on rights basis. Give journal entries for each of the following cases:
    (i) The debentures were issued at a premium of 10% and redeemable at par.
    (ii) The debentures were issued at a discount of 5% and redeemable at a premium of 10%.
    (iii) The debentures were issued at par but redeemable at a premium of 10%.
    (iv) The debentures were issued at a premium of 5% but repayable at a premium of 10%.
    (v) The debentures were issued at a discount of 5% but redeemable at par.

29. X Ltd. invited applications for 10,000 shares of Rs. 10 each at a discount of 10% payable as follows :

On application Rs. 3 ; on allotment Rs.3 ; and on first and final call Rs. 3.

Applications were received for 10,000 shares and all these were accepted. All money due was received except the allotment money and first and final call on 500 shares. These shares were subsequently forfeited and reissued at Rs. 8 per share as fully paid up.

Pass the necessary entries in the books of the company.

30. From the following information, calculate the value of goodwill by the super profit method and capitalisation method.

- Average capital employed in the business : Rs. 7,00,000
- Net trading profits for the past three years : Rs. 1,47,600 ; Rs. 1,48,100 ; and Rs. 1,52,500.
- Rate of interest expected from capital having regard to the risk involved: 18%
- Fair remuneration to the Partners for their services: Rs. 12,000 per annum
- Sundry assets excluding goodwill: Rs. 7,54,762
- Sundry liabilities: Rs. 31,329

31. On 31st March, a bank had the following bills which were discounted earlier :

Date of bill	Term of Bill (Months)	Discounted @ % p.a.	Amount of Bill
January 17	4	17	Rs. 7,30,000
February 7	3	18	Rs.14,60,000
March 9	3	17.5	Rs. 3,64,000

Calculate the Rebate on Bills Discounted. Also show the necessary journal entry for the rebate.

(6 × 4 = 24)

Part D – Essays

Answer any **two** *questions.*

Each question carries 15 marks.

32. The following Balance Sheet of a company is given below :

Liabilities	Rs.	Assets	Rs.
Equity Share Capital	5,00,000		
		Sundry Assets	6,00,000
2,000,6% Redeemable Preference Shares of Rs. 100 each	2,00,000	Cash	4,00,000
Sundry Creditors	50,000		
Profit and Loss Account	2,50,000		
Total	10,00,000	Total	10,00,000

On the above date, preference shares are redeemed at Rs. 105.

Journalise the transactions and prepare the amended Balance Sheet.

33. The following details are ascertained in relation to a company :

Capital

- 10,000 'A' Equity Shares of Rs. 10 each, fully paid
- 10,000 'B' Equity Shares of Rs. 10 each, Rs. 7.50 per share paid
- 10,000 'C' Equity Shares of Rs. 10 each, Rs. 5 per share paid
- General Reserve: Rs. 1,20,000
- External Liabilities: Rs. 55,000
- Tangible Assets: Rs. 4,00,000

The normal average profits of the company are estimated to be Rs. 36,000 and the estimated rate for capitalisation purposes is 8%.

Calculate the value of each type of share by:

1. Asset Backing Method
2. Earning Capacity Method

34. The following Balance Sheet of HKT Ltd. as at 31-03-2017 is given below:

Liabilities	Rs.	Assets	Rs.
Issued and Paid-up Share Capital	2,00,000	Freehold Property	2,00,000
Profit and Loss A/c	1,80,000	Stock in Trade	1,20,000
12% Debentures	1,20,000	Sundry Debtors	1,00,000
Sundry Creditors	1,00,000	Cash and Bank Balance	1,80,000
Total	6,00,000	Total	6,00,000

It is resolved at the Annual Meeting :

(a) To pay a dividend of 10%.

(b) To issue one bonus share for every four shares held.

(c) To give existing shareholders the option to buy one Rs. 10 share at Rs. 14 for every four shares held prior to bonus distribution.

(d) To repay the debentures at a premium of 4%.

All shareholders took up the option in (c).

Pass journal entries and draw up the Balance Sheet after giving effect to the above transactions. Ignore taxation.

35. What is meant by redemption of debentures. Describe the various methods of debentures. Give suitable illustrations.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.Sc. DEGREE (CBCSS) EXAMINATION, JUNE 2026

Third Semester

Core Course : MICROBIOLOGY AND PHYCOLOGY

(Common for B.Sc. Botany Model I and Model II)

(2013 Admission onwards)

Time : Three Hours Maximum : 60 Marks

Part A

Answer **all** *questions.*
Each question carries 1 mark.

1. Explain algal blooms.
2. Identify one Cyanobacteria as a source of restriction endonuclease.
3. Name any two commercial products from Algae.
4. What is a biopesticide ?
5. What is a bioreactor ?
6. Name two members of Chlorophyceae.
7. What is a capsid ?
8. Explain Bioremediation.

(8 × 1 = 8)

Part B

Answer any **six** *questions.*
Each question carries 2 marks.

9. 'Bacteria can cause food spoilage'. Explain with examples.
10. Write about characteristic features of Mycoplasma.
11. Write about sexual reproduction in Pinnularia.
12. Give an account of red tides.
13. Write about different types of viruses based on the structure.
14. Explain the importance of algae in biofuel production.
15. Write about the structure of bacterial flagellum.

16. Explain the cell structure of Oedogonium.
17. Point out the importance of algae in maintaining soil fertility.
18. Write about single-cell proteins.

(6 × 2 = 12)

Part C

Answer any **four** *questions.*
Each question carries 4 marks.

19. Explain how algae can be cultured. Mention the scope of algal culture
20. Write about importance of bacteria in nitrogen cycle
21. Explain Grams' staining
22. Describe sexual reproduction in Sargassum
23. Explain how bacteriophages reproduce
24. 'Bacteria can be used for conversion of waste products into useful products'. Substantiate this with two examples

(4 × 4 = 16)

Part D

Answer any **two** *questions.*
Each question carries 12 marks.

25. Explain importance of microbes in the production of Biogas, Probiotics and Vinegar
26. Describe reproduction in Polysiphonia
27. Explain the structure of a bacterial cell wall. Write about conjugation
28. Explain the life cycle and reproduction in Chara

(2 × 12 = 24)

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Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Core Course—ANIMAL DIVERSITY : NON-CHORDATA

(Common for the Programmes B.Sc. Zoology Model I, Model II, B.Sc. Industrial Microbiology and Zoology)

[2013—2016 Admissions]

Time : Three Hours Maximum Marks : 60

Part A (Short Answer Questions)

Answer **all** *questions.*
1 *mark each.*

1. Name the larval forms of *Penaeus.*
2. What are the affinities of *Peripatus ?*
3. What is the evolutionary significance of *Limulus ?*
4. What is the ecological importance of *Trichonympha ?*
5. What are the ecological adaptations of *Dentalium ?*
6. What is parasitic castration? Give an example.
7. Distinguish between radial and bilateral symmetry with suitable examples.
8. What are cnidoblasts ?

(8 × 1 = 8)

Part B (Brief Answer Questions)

Answer any **six** *questions.*
2 *mark each.*

9. Write an account on any two vectorial arthropods.
10. Enlist the unique features of *Pleurobrachia.*
11. Explain the parasitic adaptations of *Hirudinaria.*
12. Discuss the salient features of class Trilobita.

Turn over

13. Discuss the merits and demerits of five kingdom classification.

14. Distinguish between Chilopoda and Diplopoda citing suitable examples.

15. What are the salient features of *Sipunculus* ?

16. Distinguish between Calcarea and Hexactinellida.

17. Enlist any five salient features of phylum Ciliophora citing an example.

18. Explain the parasitic adaptations of *Wuchereria* and *Ancylostoma*.

(6 × 2 = 12)

Part C (Problems/Derivations)

Answer any **four** *questions.*
4 *marks each.*

19. Explain the salient features and affinities of Hemichordata.

20. Explain the water vascular system in Echinoderms.

21. Explain the life cycle of *Plasmodium*.

22. With suitable diagrams explain the structure of abdominal appendages in *Penaeus*.

23. With a suitable diagram explain the morphology and life cycle of *Obelia*.

24. Briefly explain reproduction in sponges.

(4 × 4 = 16)

Part D (Long Answer/Problem Questions)

Answer any **two** *questions.*
12 *marks each.*

25. Explain the life cycle of *Fasciola hepatica*.

26. Explain the respiratory system and mechanism of respiration in *Penaeus*.

27. Write an essay on polymorphism in Coelenterates.

28. Classify phylum Mollusca upto class citing suitable examples.

(2 × 12 = 24)

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Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Mathematics

VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND ANALYTIC GEOMETRY

(Common for B.Sc. Physics, Chemistry, Petrochemicals, Geology, Computer Maintenance and Electronics and Food Science and Quality Control)

[2013–2016 Admissions]

Time : Three Hours Maximum Marks : 80

Part A

Answer **all** *questions.*

Each question carries 1 *mark.*

1. Find the velocity and acceleration of a particle in space at time 't' = $\pi / 2$ whose position vector is given by $r(t) = (2\cos t)i + (3\sin t)\,j + 4tk$.

2. Write the formulas for finding the unit tangent vector and principal unit normal vector for curves in space.

3. Given $f(x, y) = x - y$ and $g(x, y) = 3y$. Find $\nabla(f + g)$ and $\nabla(f - g)$.

4. Find the gradient field of $f(x, y, z) = xyz$.

5. Define flux across a closed curve in the plane.

6. State Green's theorem in the plane.

7. Define an exact differential equation.

8. Define a linear equation.

Turn over

9. Write the vertices and foci of the ellipse $\frac{x^2}{16}+\frac{y^2}{9}=1$.

10. Find the eccentricity of the hyperbola $9x^2-16y^2=144$.

(10 × 1 = 10)

Part B

Answer any **eight** *questions.*
Each question carries 2 marks.

11. Show that $r(t)=(\sin t)\,i+(\cos t)\,j+\sqrt{3}\,k$ has constant length and is orthogonal to its derivative.

12. Find the unit tangent vector to the curve $r(t)=(2+t)\,i-(t+1)\,j+tk,\ 0\le t\le 3$ and also find the length of the curve.

13. Find the curvature of the curve $r(t)=(a\cos t)\,i+(a\sin t)\,j$.

14. A coil spring lies along the helix $r(t)=(\cos 4t)\,i+(\sin 4t)\,j+tk, 0\le t\le 2\pi$.

    The spring's density is a constant $\delta=1$. Find the spring's mass and the center of mass.

15. Find the circulation of the field $F=(x-y)\,i+xj$ around the circle

    $r(t)=(\cos t)\,i+(\sin t)\,j, 0\le t\le 2\pi$.

16. State Stoke's Theorem.

17. Show that the field $F=(2x-3)\,i-zj+(\cos z)\,k$ is not conservative.

18. Test for exactness the equation $\left(x^2+y\right)dx+\left(y^2+x\right)dy=0$.

19. Find an integrating factor for the equation $xdy-ydx=\left(1+y^2\right)dy$.

20. Solve the equation $p^2 + p - 6 = 0$, where $p = \frac{dy}{dx}$.

21. Sketch the parabola $y^2 = -2x$ by including the focus and directrix.

22. Find a Cartesian equation for the curve $x = 4\cos t, y = 5\sin t, 0 \le t \le \pi$.

(8 × 2 = 16)

Part C

Answer any **six** *questions.*

Each question carries 4 *marks.*

23. Find and graph the osculating circle of the parabola $y = x^2$ at the origin.

24. Find the binormal vector 'B' and torsion '$\mathcal{T}$' for the curve $r(t) = (3\sin t)i + (3\cos t)j + 4tk$.

25. Evaluate $\int_C (x - y + z - 2)\,ds$ where C is the straight line segment $x = t, y = 1 - t,\ z = 1$ from $(0, 1, 1)$ to $(1, 0, 1)$.

26. Find the work done by $F = xyi + yj - yzk$ over the curve $r(t) = ti + t^2 j + tk, 0 \le t \le 1$.

27. Show that $F = (e^x \cos y + yz)i + (xz - e^x \sin y)j + (xy + z)k$ is conservative and find a potential function for it.

28. Use Green's theorem to find the counter clockwise circulation and outward flux for the field $F = (x^2 + 4y)i + (x + y^2)j$ over the curve C. Which is the square bounded by $x = 0, x = 1, y = 0, y = 1$.

29. Solve the equation $\frac{dy}{dx} + y\cos x = 2\sin 2x$.

30. Replace the polar equation $r\cos\theta = 2$. by an equivalent Cartesian equation and describe the graph.

31. Replace the Cartesian equation $x^2 - y^2 = 1$ by an equivalent polar equation.

(6 × 4 = 24)

Turn over

Part D

Answer any **two** *questions.*

Each question carries 15 *marks.*

32. (a) Find the directions in which $f(x, y) = x^2 + xy + y^2$ increase and decrease most rapidly at $p_0(-1, 1)$ and find the derivatives of the function in these directions.

    (b) Find the area of the surface cut from he bottom of the paraboloid $x^2 + y^2 - z = 0$ by the plane $z = 4$.

33. Use the surface integral in stoke's theorem to calculate the circulation of the field $F = 2yi + 3xj - 2^2k$ around the circle $x^2 + y^2 = 9$ in the xy plane, counter clockwise when viewed from above.

34. (a) Solve the equation :

$$\left(x^2 + y^2\right)(1 + p)^2 - 2(x + y)(1 + p)(x + yp) + (x + yp)^2 = 0 \text{ where } p = \frac{dy}{dx}.$$

    (b) Solve the equation $x^2y - x^3\frac{dy}{dx} = y^4 \cos x$.

35. (a) Sketch the hyperbola $9x^2 - 16y^2 = 144$. Include the asymptotes and foci in the sketch.

    (b) Find a polar equation for an ellipse with semi major axis 39.44 AU (astronomical units) and eccentricity 0.25.

    (c) Sketch the curve $r = \frac{1}{1 + \cos\theta}$.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Core Course (3)—CALCULUS

(Common for Model I, Model II Mathematics and B.Sc. Computer Applications)

[2013–2016 Admissions]

Time : Three Hours | Maximum Marks : 80

Part A

Answer **all** *questions.*

Each question carries 1 *mark.*

1. State Leibnitz's Theorem.
2. Verify Rolle's theorem for the function $f(x) = x(x-1)$ sin the interval $[0,1]$.
3. Define evolutes and involutes.
4. Define asymptote of a curve.
5. Find the asymptotes parallel to the co-ordinate axes of the curve $y^2\left(x^2 - a^2\right) - x = 0$.
6. State Euler's theorem on homogeneous functions.
7. Find $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$ for $f(x, y) = x^2 - xy + y^2$.
8. The region between $y = \sqrt{x}$, $0 \le x \le 4$ and the x-axis is revolved about the x-axis to generate a solid. Find is volume.

Turn over

9. Write the shell formula for finding the volume of a solid generated by revolving the region between x-axis and the graph of a continuous function $y = f(x) \geq 0$, $L \leq a \leq x \leq b$, about the vertical line $x = L$.

10. State first form of Fubini's Theorem.

$(10 \times 1 = 10)$

Part B

Answer any **eight** *questions.*

Each question carries 2 marks.

11. If $y = a \cos(\log x) + b \sin(\log x)$, prove that $x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} + y = 0$.

12. Verify Lagrange's mean value theorem for $y = 2x - x^2$ on the interval $[0, 1]$.

13. Find the radius of curvature for the curve $y = 3x^2 + 4x$ at the point $(1, 7)$.

14. Find the envelope of the family of straight lines $y = m^2 x - m^3$, where m is the parameter.

15. Find the points of inflexion on the curve $y = x^3 - 3x^2 - 9x + 9$.

16. Verify that $w_{xy} = w_{yx}$. Where $w = \ln(2x + 3y)$.

17. Find $\frac{dy}{dx}$ if $y^2 - x^2 - \sin xy = 0$.

18. Verify Euler's theorem on homogeneous function, given $u = x^3 - y^3 + 3x^2y$.

19. Use substitution formula to evaluate $\int_0^{\pi} 3 \cos^2 x \sin x \, dx$.

20. Find the length of the parameterized curve $x = 1 - t$, $y = 2 + 3t$, $\frac{-2}{3} \leq t \leq 1$.

21. Evaluate $\int_{0}^{3}\int_{-2}^{0} \left(x^2y - 2xy\right) dy\, dx$.

22. Sketch the region bounded by the co-ordinate axes and the line $x + y = z$. Express the region's area as an iterated double integral and evaluate the integral.

(8 × 2 = 16)

Part C

Answer any **six** *questions.*

Each question carries 4 *marks.*

23. Find the n^{th} derivative of $e^x \log x$.

24. Use Taylor's theorem to show that $\tan\left(\frac{\pi}{4} + x\right) = 1 + 2x + 2x^2 + \frac{8}{3}x^3 + \ldots.$

25. Find the co-ordinates of the centre of curvature at the point $x = at^2, y = 2at$ on the parabola $y^2 = 4ax$ and hence find its evolute.

26. Find all the local maxima, local minima and saddle points if any for the function

$f(x, y) = 2xy - 5x^2 - 2y^2 + 4x - 4.$

27. Evaluate $\frac{dw}{dt}$ using chain rule, where $w = x^2 + y^2$, $x = \cos t + \sin t$, $y = \cos t - \sin t$. Also find $\frac{dw}{dt}$ at $t = 0$.

28. Find the area of the region enclosed by $x = y^2$ and $x = y + z$.

29. Find the volume of the solid generated by revolving for region between the parabola $x = y^2 + 1$ and the line $x = 3$ about the line $x = 3$.

Turn over

30. Sketch the region of integration, reverse the order of integration and evaluate the integral

$$\int_0^{\pi}\int_x^{\pi} \frac{\sin y}{y}\, dy\, dx.$$

31. Change the following Cartesian integral into an equivalent polar integral and then evaluate the polar integral $\int_{-1}^{1}\int_{0}^{\sqrt{1-x^2}} dy\, dx.$

(6 × 4 = 24)

Part D

Answer any **two** *questions.*
Each question carries 15 *marks.*

32. (a) If $y = e^{a \sin^{-1} x}$, prove that

$$\left(1-x^2\right) y_{n+2} - (2n+1)\, x\, y_{n+1} - \left(n^2 + a^2\right) y_n = 0.$$

(b) Find the asymptotes of $(x-y-1)^2\left(x^2+y^2+2\right) + 6(x-y-1)(xy+7) - 8x^2 - 2x - 1 = 0.$

(c) Find the evolute of the parabola $y^2 = 8x$.

33. (a) Using the method of Lagrange Multipliers find the greatest and smallest values that the function $f(x, y) = xy$ takes on the ellipse $\frac{x^2}{8} + \frac{y^2}{2} = 1.$

(b) If $w = x^2 + y^2 + z^2$ and $z = x^2 + y^2$ find : (i) $\left(\frac{\partial w}{\partial y}\right)_z$; (ii) $\left(\frac{\partial w}{\partial z}\right)_x$; (iii) $\left(\frac{\partial w}{\partial z}\right)_y$.

34. (a) Find the length of the curve $y = \frac{4\sqrt{2}}{3} x^{3/2} - 1, 0 \le x \le 1$.

(b) Find the area of the surface generated by revolving the curve $y = 2\sqrt{x}, 1 \le x \le 2$ about the x-axis.

35. (a) Evaluate $\int_0^1 \int_0^1 \int_0^1 \left(x^2 + y^2 + z^2\right) dz\, dy\, dx$.

(b) Convert the integral $\int_{-1}^{1} \int_{0}^{\sqrt{1-y^2}} \int_{0}^{x} \left(x^2+y^2\right)\, dz\, dx\, dy$ to an equivalent integral in cylindrical co-ordinates and evaluate it.

$(2 \times 15 = 30)$

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Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Complementary Course—Mathematics

NUMERICAL METHODS

(For Programme B.Sc. Electronics)

Time : Three Hours | Maximum Marks : 80

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. Write the precision of the number 4.320106.
2. What are inherent errors ?
3. What is meant by homogeneous equation ?
4. What is Pivoting ?
5. What is Interpolation ?
6. What are divided differences ?
7. What is regression analysis ?
8. What is numerical differentiation ?
9. What is numerical integration ?
10. Write the formula of Euler's method for finding numerical solution of ordinary differential equation.

(10 × 1 = 10)

Part B

Answer any **eight** *questions from this Part.*
Each question carries 2 *marks.*

11. Find the round-off error using four digit mantissa for the arithmetic operation 27.65 + 22.20.
12. Calculate the absolute and relative error in the operation 1250.0 × 40.0.

Turn over

13. What is an iterative technique ?

14. Evaluate the polynomial $f(x) = 2x^3 + 4x^2 - 2x + 5$ at $x = 3$ using Horner's rule.

15. State some basic rules that are used in the elimination method of solving simultaneous linear equations.

16. Find the inverse of the matrix $\begin{bmatrix} 2 & 3 & 4 \\ 4 & 2 & 3 \\ 3 & 4 & 2 \end{bmatrix}$ using Gauss-Jordan elimination technique.

17. State two important factors that are to be considered while applying iterative method.

18. What is curve fitting ? What is the need of it ?

19. State the second order Newton's divided difference interpolation polynomial.

20. What is the principle of least square regression ?

21. What is three-point formula ? How is it different from the two point formula.

22. What is Simpson's $\frac{1}{3}$ rule ?

$(8 \times 2 = 16)$

Part C

Answer any **six** *questions.*
Each question carries 4 *marks.*

23. What is machine epsilon ? How is it related to significant digits.

24. Find a root of the equation $e^x - x - 2 = 0$ using bisection method.

25. Use false position formula repeatedly and obtain roots of the equation $\sin x - x + 2 = 0$.

26. Solve the following system of equations using simple elimination process :

$$\begin{aligned} x + y + z &= 6 \\ 2x - y + 3z &= 4 \\ 4x + 5y - 10z &= 13. \end{aligned}$$

27. Obtain the solution of the system :

$$2x_1 + x_2 + x_3 = 5$$
$$3x_1 + 5x_2 + 2x_3 = 15$$
$$2x_1 + x_2 + 4x_3 = 8$$

by Jacobi iteration method.

28. Find the quadratic interpolating polynomial for the following set of points $(-1, 1), (0, 1)$ and $(1, 3)$.

29. Use least square regression to fit a straight line to the data given below :

x	:	1	3	4	6	8	9	11
y	:	1	2	4	4	5	7	8

Along with slope and intercept, also. Compute the standard error of the estimate.

30. Estimate the first derivative of $f(x) = \ln x$ at $x = 1$ using :

(a) The first order backward difference formula ; and

(b) The first order forward difference formula.

31. Evaluate $\int_0^2 \left(3x^2 + 2x - 5\right) dx$ using basic Simpson's $\frac{1}{3}$ rule.

$(6 \times 4 = 24)$

Part D

Answer any **two** *questions.*
Each question carries 15 *marks.*

32. (a) Compute a root of the equation $x^2 - 5x + 6 = 0, x_0 = 5,$ using Newton-Raphson method.

(b) Use secant method to find a root of the equation $4x^3 - 2x - 6 = 0$.

Turn over

33. (a) Solve the following system of equations using Gauss-Jordan method :

$$x_1 + 2x_2 - 3x_3 = 4$$
$$2x_1 + 4x_2 - 6x_3 = 8$$
$$x_1 - 2x_2 + 5x_3 = 4.$$

(b) Solve the following system of equations using Gauss-Seidal method :

$$2x - 7y + 10z = -17$$
$$5x + y + 3z = 14$$
$$x + 10y + 9z = 7.$$

Assume suitable initial values.

34. (a) Find the Lagrange interpolation polynomial which agrees with the following data :

x	:	1.0	1.1	1.2
$\cos x$	:	0.5403	0.4536	0.3624

Use it to estimate $\cos(1.15)$.

(b) Fit a second order polynomial to the following data :

x	:	1.0	2.0	3.0	4.0
y	:	6.0	11.0	18.0	27.0

35. (a) Use Trapezoidal rule with $n = 4$ to estimate $\int_0^1 \frac{dx}{1+x^2}$.

(b) Solve the equation $\frac{dy}{dx} = x^2y - y, y(0) = 1$ by Picard's method and estimate y at $x = 0.25$ and 0.5.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Complementary Course–Statistics—PROBABILITY DISTRIBUTIONS

(Common to B.Sc. Mathematics, Physics and Computer Applications (3 Main))

[2013-2016 Admissions]

Time : Three Hours Maximum : 80 Marks

Part A (Short Answer Questions)

Answer **all** *questions.*
1 mark each.

1. Define a binomial distribution.
2. What is the mean and variance of standard normal distribution ?
3. Define type - 1 beta distribution.
4. Define one parameter gamma distribution.
5. For a Poisson distribution with mean = 3, find P (X = 0).
6. Define the geometric distribution.
7. State Tchebycheffs inequality.
8. What are the parameters of an F-distribution ?
9. Define *chi- square* distribution.
10. What do you mean by sampling distribution ?

(10 × 1 = 10)

Part B (Brief Answer Questions)

Answer any **eight** *questions.*
2 marks each.

11. Obtain the mgf of binomial distribution.
12. Obtain the mgf of two parameter gamma distribution.
13. If X follows normal distribution with mean 5 and SD 3, find the distribution of Y = 2X + 5.
14. What is the memoryless property of the exponential distribution ?
15. Write the recurrence relation for moments of Poisson distribution.

Turn over

16. Mention any two advantages of Tchebycheffs inequality.
17. State Bernoulli's law of large numbers.
18. Derive the additive property of gamma distribution.
19. Find the mean and variance of an exponential distribution with parameter θ.
20. Define standard error and state its importance.
21. Mention two properties of Student's t-distribution.
22. How are the *t, chi-square*, and F distributions related ?

$(8 \times 2 = 16)$

Part C

Answer any **six** *questions.*

4 marks each.

23. Derive the recurrence relation connecting central moments of a binomial distribution.
24. If a Poisson variate X is such that $P[X=1]=2P[X=2]$, find the mean and variance of the distribution.
25. A manufacturer, who produces medicine bottles, finds that 0.1% of the bottles are defective. The bottles are packed in boxes containing 500 bottles. A drug manufacturer buys 100 boxes from the producer of bottles. Using Poisson distribution, find how many boxes will contain at least two defective bottles.
26. Find the mean and variance of two parameter gamma distribution.
27. In a large group of students, 5% are under 150 cm and 40% are between 150 cm and 162 cm in height. Assuming normal distribution, find the mean and standard deviation of height.
28. If $E(X)=3, E(X2)=13$, use Tchcbycheff's inequality to find a lower bound for $P(-2<X<8)$.
29. A sample of size n is taken from a population with mean μ and SD σ. Find the limits within which the sample mean $\bar{x}$ will lie with probability 0.9 by using Tchebycheffs inequality and central limit theorem. Evaluate the limits if $n=64, \mu=10$ and $\sigma=2$.
30. Obtain the m.g.f. of a χ^2 variate and hence obtain its mean and variance.
31. Derive the sampling distribution of mean of sample taken from normal population.

$(6 \times 4 = 24)$

Part D

Answer any **two** *questions.*

Each question carries 15 marks.

32. Fit a Poisson distribution to the following data and find the expected frequency :

Variable	0	1	2	3	4	5	6	7
Frequency	103	143	98	42	8	4	2	0

33. (i) Define the normal distribution. What are its important properties ?

    (ii) Obtain the m.g.f. of $X \sim N(0,1)$.

34. (i) State and prove Weak Law of Large Numbers.

    (ii) Show that the Weak Law of Large Numbers is true for the mean of a random sample of size n from a population with finite mean and variance.

35. State and prove Lindeberg-Levy's form of the Central Limit Theorem (CLT).

$(2 \times 15 = 30)$

F 3574

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Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Complementary Course—QUANTUM MECHANICS, SPECTROSCOPY, NUCLEAR PHYSICS, BASIC ELECTRONICS AND DIGITAL ELECTRONICS

(For Mathematics and Statistics)

[2013—2016 Admissions]

Time : Three Hours Maximum Marks : 60

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. What is Photoelectric effect ?
2. What is meant by normalization of wave functions ?
3. List the salient features of Rutherford's nuclear atom model.
4. Define binding energy per nucleon. What is its significance ?
5. What is artificial radio activity ?
6. What is riffle factor in rectifiers ?
7. State de Morgan's theorem.
8. What is the purpose of feedback in amplifiers ?

(8 × 1 = 8)

Part B

Answer any **six** *questions.*
Each question carries 2 *marks.*

9. State and explain the uncertainty principle.
10. Explain de-Broglie hypothesis.
11. Explain the fine structure of Hydrogen atom.

Turn over

12. Define the term packing fraction.

13. What is electric quadrupole moment ?

14. State the properties of nuclear forces.

15. Write a note on doping of a semi-conductor.

16. How does a transistor act as an amplifier ?

17. Explain the working of a half wave rectifier.

18. Convert $1100.11_{(2)}$ to decimal number system.

(6 × 2 = 12)

Part C

Answer any **four** *questions.*
Each question carries 4 *marks.*

19. What is the de Broglie wavelength of 20keV electron used in a scanning electron microscope ?

20. Explain in detail Sommerfeld's relativistic atomic model.

21. Explain the important properties of atomic nuclei.

22. State and explain the law of radioactive decay.

23. What is Zener effect ? Explain the use of a Zener diode as voltage regulator.

24. Explain the XOR gate with its logic symbol, Boolean expression and truth table.

(4 × 4 = 16)

Part D

Answer any **two** *questions.*
Each question carries 12 *marks.*

25. Describe the Davison - Germer experiment and bring out the various conclusions.

26. Explain the rotational spectra of a rigid diatomic molecule.

27. What is a full wave bridge rectifier ? Explain the working of it with a neat diagram.

28. Explain NAND and NOR gates with their symbols, Boolean expressions and truth tables. Why are NAND and NOR called universal gates ?

(2 × 12 = 24)

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Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Core Course—ELECTRONICS

(Common for B.Sc. Physics Model I, B.Sc. Physics Model II, B.Sc. Physics EEM and B.Sc. Physics Instrumentation)

[2013—2016 Admissions]

Time : Three Hours Maximum Marks : 60

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. The voltage at which the diode starts conducting is called ———— voltage.
2. Maximum rectifying efficiency of half wave rectifier is ————.
3. In a shunt capacitor filter, ripple decreases with ———— in load resistance.
4. The voltage gain in a common collector circuit is ————.
5. Cross-over distortion is present in class ———— amplifier.
6. The primary advantage of a crystal oscillator is that ————.
7. The amplitude Modulation index ranges from ———— to ————.
8. A transistor Hartley oscillator uses ———— feedback.

(8 × 1 = 8)

Part B

Answer any **six** *questions.*
Each questions carries 2 *marks.*

9. State the diode current equation and explain each term in it.
10. Differentiate Avalanche and Zener breakdown mechanism.

Turn over

11. Explain the working of a positive clipper circuit.

12. Explain the working of an LC filter.

13. Compare the four properties of CB and CE configurations.

14. What do you mean by thermal runaway in transistors ?

15. Define load line. What is its significance in the design of an amplifier ?

16. How does MOSFET differ from a FET ?

17. Explain the concept of virtual ground as applicable to op-amp circuits.

18. What is the Barkhausen condition for sustained oscillations in an oscillator ?

(6 × 2 = 12)

Part C

Answer any **four** *questions.*
Each questions carries 4 *marks.*

19. A power supply provides 100 mA at 20 V d.c. It uses a capacitance filtering and is driven from a 50 Hz source. Find the ripple factor for full wave rectification if C = 1000μF.

20. Explain the action of π-section filter.

21. Calculate the d.c. bias currents and voltages for a voltage divider bias circuit having R_1 = 40 K, R_2 = 10 K, R_C = 1.5 K, R_E = 2 K, V_{cc} = 10 V, β = 100 and V_{BE} = 0.7 V.

22. Draw the circuit diagram of a Colpitt's oscillator. Calculate its frequency when C_1 = 10 pF and C_2 = 22 pF and L = 100 μH.

23. In an AM wave, the modulation index = 0.5. If the carrier and one side band are suppressed, find the percentage power saving. What change will occur by increasing the modulation index to 1 ?

24. Briefly explain the frequency modulation with application.

(4 × 4 = 16)

Part D

Answer any **two** *questions.*
Each questions carries 12 *marks.*

25. Draw the circuit diagram of a centre tapped full wave rectifier. Explain the working and derive expressions for the efficiency and ripple factor.

26. Explain the need for the biasing of a transistor amplifier. Explain the voltage divider bias in detail and describe how the method achieves stability of operating point.

27. Explain the principle of feedback in amplifiers. Discuss the advantages of negative feedback. What is the use of positive feedback ?

28. Describe the functioning of an op-amp as an adder.

(2 × 12 = 24)

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Reg. No.....

Name.....

B.A. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

B.A. Economics

Core Course—FUNDAMENTALS AND PRINCIPLES OF FOREIGN TRADE

(2013—2016 Admissions)

Time : Three Hours | Maximum Marks : 80

Part A (Definition Types Questions)

Answer **all** *the questions in one sentence each.*
Each question carries 1 *mark.*

1. Absolute cost advantage.
2. Gains from trade.
3. Terms of trade.
4. Exchange rate.
5. Current account.
6. Official reserve account.
7. Depreciation
8. Trade protection.
9. Tariff.
10. Quota.

(10 × 1 = 10)

Turn over

Part B

Answer any **eight** *of the following questions in a paragraph.*
(Not exceeding 100 *words).*
Each question carries 2 *marks.*

11. Explain the difference between internal and international trade.

12. Explain opportunity cost theory.

13. What is Balance of payment ?

14. Explain offer curve.

15. What do you mean by factor endowment ?

16. What do you mean by net barter terms of trade ?

17. Explain the objectives of devaluation.

18. Distinguish between free trade and protection

19. Explain the major instruments of protection.

20. What do you mean by capital account ?

21. What is an import Quota ?

22. What do you mean by surplus in the BOP ?

(8 × 2 = 16)

Part C (Short Essays)

Answer any **six** *of the following questions in one and a halfpages each.*
(Not exceeding 150 *words).*
Each question carries 4 *marks.*

23. Distinguish between absolute advantage and comparative advantage.

24. Write a note on the Heckscher-Ohlin Theory.

25. What is the Leontief paradox ?

26. What is secular deterioration of terms of trade ?

27. Explain the Marshall-Lerner condition.

28. Distinguish between income and commodity terms of trade.

29. Discuss the different types of Protection.

30. Distinguish between depreciation and devaluation.

31. What are the major types of quota restrictions ?

(6 × 4 = 24)

Part D

Answer any **two** *of the following questions.*
(Not exceeding four pages *each).*
Each question carries 15 *marks.*

32. Illustrate why international trade is beneficial even when one country has an absolute advantage in all goods.

33. Explain the relationship between trade and economic development. How does deterioration in terms of trade affect developing countries.

34. Explain the structure and components of the Balance of Payments.

35. Discuss the causes and measures to correct disequilibrium in BoP.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Complementary Course—PROBABILITY AND STATISTICS

(For B.Sc. Computer Science)

[2013—2016 Admissions]

Time : Three Hours Maximum Marks : 80

Part A (Short Answer Questions)

Answer **all** *questions.*
1 *mark each.*

1. What is a measure of central tendency ?
2. Define Skewness.
3. What do you mean by Kurtosis ?
4. Define Correlation.
5. Name a discrete distribution for which mean = variance.
6. Define conditional probability.
7. Define uniform distribution of the discrete type.
8. Define the mathematical expectation of a random variable.
9. State the Central Limit Theorem.
10. Define point estimation.

(10 × 1 = 10)

Part B (Brief Answer Questions)

Answer any **eight** *questions.*
2 *marks each.*

11. Give any *two* advantages of sampling over census.
12. Define arithmetic mean and mention its uses.

Turn over

13. How do you interpret when the co-efficient of correlation is zero ?

14. State multiplication theorem of probability for three events.

15. Define discrete random variable. Give an example.

16. What are the characteristics of Poisson distribution ?

17. If $E(X) = 3.5$, find $E(2X + 7)$.

18. Define the binomial distribution.

19. State the mean of a Poisson distribution.

20. What do you mean by sampling distribution ?

21. Define interval estimation.

22. What is a test of statistical significance ?

$(8 \times 2 = 16)$

Part C

Answer any **six** *questions.*
4 *marks each.*

23. Find the median for the following data :

Size	:	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60
Frequency	:	8	10	20	25	30	26	24	20	18	14	10

24. Explain different methods of collecting primary data.

25. The pass result of 50 students who took a class test is given below. Find standard deviation and variance for the following data :

Marks	:	40	50	60	70	80	90
No. of students	:	8	10	9	6	4	3

26. State Baye's theorem. What is its significance ?

27. There are 20 persons. 5 of them are graduates. 3 persons are randomly selected from these 20 persons. Find the probability that at least one of the selected persons is graduate.

28. Derive mean and variance of a Poisson distribution with parameter λ.

29. Explain the important properties of expectation with suitable examples.

30. The probability that a bomb dropped hits the target is 0.2, find the probability that out of 6 bombs dropped (i) Exactly two will hit the target ; and (ii) Atleast 2 will hit the target.

31. Define the Chi-square distribution and state its important properties.

(6 × 4 = 24)

Part D

Answer any **two** *questions.*
15 *marks each.*

32. Find the moment measure of skewness :

Class	:	30-34	35-39	40-44	45-49	50-54	55-59
Frequency	:	2	3	5	6	2	2

33. A factory has three machines A, B and C with daily production 1000, 2500 and 1500 units respectively. The proportion of defectives produced by the machines are 0.05, 0.08 and 0.06 respectively, (i) Find the probability that a unit selected at random from the daily production is defective ; and (ii) If it is found to be defective, find the probability that it has come from machine B.

34. Define the normal distribution and explain its important properties. Derive its MGF and hence obtain its mean and variance.

35. Define Student's t-distribution. State and explain its important properties and applications.

(2 × 15 = 30)

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Reg. No.....

Name.....

B.C.A. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Core Course–DESIGN AND ANALYSIS OF ALGORITHMS

(2013–2016 Admissions)

Time : Three Hours Maximum Marks : 80

Part A (Short Answer Questions)

Answer **all** *questions.*
Each question carries 1 mark.

1. What is algorithm efficiency ?
2. What is order of growth for an algorithm ?
3. What is Little Omega notation of an algorithm ?
4. What is an optimal solution ?
5. What is binary search ?
6. What is a minimum spanning tree ?
7. What is pruning ?
8. Which data structure is used for BFS ?
9. What is backtracking ?
10. What is decrease and conquer ?

(10 × 1 = 10)

Part B (Brief Answer Questions)

Answer any **eight** *questions.*
Each question carries 2 marks.

11. What are the various characteristics of an algorithm ?
12. What is Big Oh notation of an algorithm ?
13. What is space complexity of an algorithm ?
14. What is greedy method ?
15. What is control abstraction ?
16. What is Huffman code ?

17. What is dynamic programming ?
18. What is a bi-connected graph ?
19. What is OBST ?
20. What is a Hamiltonian cycle ?
21. What is DFS ?
22. What is insertion sort ?

(8 × 2 = 16)

Part C (Descriptive/Short Essay Type Questions)

Answer any **six** *questions.*
Each question carries 4 marks.

23. Briefly, explain the steps in merge sort
24. Briefly, explain the knapsack problem with example
25. Suppose you have 6 containers whose weights are 20, 40, 50, 10, 40 and 15, and a ship whose capacity c = 100. Use greedy method algorithm to find an optimal solution to this container loading problem.
26. Write an algorithm to find solution to the Towers of Hanoi problem
27. Briefly, explain Kruskal's algorithm with an example
28. Briefly, explain optimal file merge patterns with an example
29. Briefly, explain sum of subsets problem with an example
30. Briefly, explain graph coloring with an example
31. Briefly, explain BFS

(6 × 4 = 24)

Part D (Essay)

Answer any **two** *questions.*
Each question carries 15 marks.

32. Explain quick sort algorithm with suitable examples and illustrations
33. Explain Travelling Salesperson Problem with bounding and branching with suitable examples and illustrations
34. Find the minimum spanning tree of the following graph using Prim's algorithm
35. Explain an algorithm to solve 8 queens problem using backtracking method with suitable examples and illustrations

(2 × 15 = 30)

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Reg. No.....

Name.....

B.C.A. DEGREE (C.B.C.S.S.) EXAMINATION, JUNE 2026

Third Semester

Complementary Course—ADVANCED STATISTICAL METHODS

(For the Programme B.C.A.)

[2013—2016 Admissions]

Time : Three Hours Maximum Marks : 80

Part A (Short Answer Questions)

Answer all **ten** *questions.*
1 *mark each.*

1. What are the parameters of Normal distribution ?
2. Write down the moment generating function of Poisson distribution.
3. Define Sampling Distribution.
4. Define standard error.
5. Define point estimation.
6. Define Efficiency.
7. What is the mean of chi-square distribution ?
8. Define simple hypothesis.
9. Differentiate small sample and large sample.
10. Define level of significance.

(10 × 1 = 10)

Part B (Brief Answer Questions)

Answer any **eight** *questions.*
2 *marks each.*

11. State any *two* properties of binomial distribution.
12. What are the commonly used sampling distributions ?

Turn over

13. A random variable X is distributed as normal with mean 20 and variance 4. Evaluate Probability of $X > 20$.

14. Point out some uses of F distribution.

15. What are the properties of a good estimator ?

16. Write down the test statistic for testing equality of mean when population SD"s are known.

17. State Neyman-Pearson lemma for deriving most powerful test.

18. Give the principal steps in testing of hypotheses.

19. Write down a 90% confidence limits for population mean for a given sample mean and sample SD.

20. Define *t* variate with n degrees of freedom.

21. Distinguish between Type I and Type II errors.

22. State the conditions under which a Z-test is applicable.

$(8 \times 2 = 16)$

Part C

Answer any **six** *questions.*
4 *marks each.*

23. Give the properties of normal distribution.

24. If a random variable X follows a Poisson distribution such that $P(X=1) = P(X=2)$. Find $P(X=0)$.

25. The weekly wages of 1000 work men are normally distributed with a mean of 70 and SD of 5. Estimate the number of workers whose wages will be between 69 and 72.

26. In two colleges affiliated to a university 46 out of 200 and 48 out of 250 candidates failed in an examination. If the percentage of failure in the university is 18 %, examine whether the colleges differ significantly.

27. Define interval estimation and explain its advantages over point estimation.

28. Explain the procedure for testing independence of attributes.

29. What are the uses of *t* distribution ?

30. What is test for goodness of fit ? State the null and alternative hypotheses for goodness of fit test.

31. What are the properties of Chi-square distribution ?

$(6 \times 4 = 24)$

Part D

Answer any **two** *questions.*
15 *marks each.*

32. State the inter-relationship between normal, Chi-square, *t* and F-variates.

33. Explain sampling distribution with example.

34. Explain the steps involved in hypothesis testing.

35. A sample of 400 men from South India has a mean height of 65.85 inches and a SD of 2.50 inches while a sample of 100 men from North India has a mean height of 66.20 inches with a SD of 2.52 inches. Do the data indicate that North Indian's are on the average taller than South Indian's.

(2 × 15 = 30)