



Register Number :

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Subject Code : 22 (NS)

**ECONOMICS**

(Kannada and English Versions)

Time : 3 Hours 15 Minutes]

[Total No. of questions : 51]

[Max. Marks : 100]

(Kannada Version)

- ಸೂಚನೆಗಳು :
1. ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆಗಳನ್ನು ಮಾರ್ಜಿನ್‌ನಲ್ಲಿ ಸ್ಪಷ್ಟವಾಗಿ ಬರೆಯಿರಿ.
 2. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಉತ್ತರವು ನಿರಂತರವಾಗಿರಬೇಕು.

ಭಾಗ - ಎ

I. ಸರಿಯಾದ ಉತ್ತರವನ್ನು ಆರಿಸಿ ಬರೆಯಿರಿ :

(10 × 1 = 10)

1) ತುಷ್ಟಿಗುಣವು

a) ವಸ್ತುನಿಷ್ಠ

b) ವ್ಯಕ್ತಿನಿಷ್ಠ

c) a) ಮತ್ತು b) ಎರಡೂ

d) ಮೇಲಿನ ಯಾವುದೂ ಅಲ್ಲ



(English Version)

- Instructions :**
1. Write the question numbers **legibly** in the margin.
 2. Answer for the questions should be continuous.

PART – A

I. Choose the correct answer : **(10 × 1 = 10)**

- 1) Utility is
 - a) Objective
 - b) Subjective
 - c) Both (a) and (b)
 - d) None of the above
- 2) The change in output per unit of change in the input is called
 - a) Marginal product
 - b) Average product
 - c) Total product
 - d) Product
- 3) A market structure which produces heterogeneous products is called
 - a) Monopoly
 - b) Monopolistic competition
 - c) Perfect competition
 - d) None of the above
- 4) The individuals or institutions which take economic decisions are
 - a) Economic variables
 - b) Economists
 - c) Economic agents
 - d) None of the above
- 5) The study of the National Income is related to
 - a) Micro Economics
 - b) Macro Economics
 - c) Both Micro and Macro
 - d) None of the above



13) _____ is the only institution which can issue currency in India.

14) Savings is the part of Income that is _____.

15) Financial year runs from _____ to _____ in India.

III. Match the following.

(5 × 1 = 5)

16) A

B

a) Service of Teacher

i) Dirty floating

b) Normal Profit

ii) Skill

c) Market Equilibrium

iii) Trade in goods

d) Balance of trade

iv) Zero Profit

e) Managed floating

v) QD = QS

PART – B

IV. Answer **any nine** of the following in **4** sentences **each**.

(9 × 2 = 18)

17) What are the differences between budget line and budget set?

18) What do you mean by Inferior goods? Give example.

19) What is monotonic preference?



- 20) Mention two different approaches which explain consumer behaviour.
- 21) Mention the two determinants of a firm's supply curve.
- 22) Define equilibrium price and quantity.
- 23) Write the features of monopoly.
- 24) State the meaning of Average Revenue and Marginal Revenue.
- 25) What are the four factors of production? Mention their rewards.
- 26) Distinguish between stock and flow.
- 27) Give the meaning of CRR and SLR.
- 28) Give the meaning of paradox of thrift.
- 29) Who are free riders? Why are they called so?
- 30) What is foreign exchange rate?



PART – C

V. Answer **any seven** of the following questions in **12** sentences **each**.
(7 × 4 = 28)

- 31) Write a short note on Market Economy.
- 32) Explain the long run costs.
- 33) Write a short note on Profit Maximisation of a firm under the following conditions.
 - a) $P = MC$
 - b) MC must be non decreasing at q_0 .
- 34) Explain the role of the Government (State) and household sector in both developed and developing countries.
- 35) Write a note on externalities.
- 36) Illustrate unplanned accumulation and decumulation of inventories with the example.
- 37) Briefly explain the functions of RBI.



- 38) Briefly explain consumption function.
- 39) Write the chart of the Government Budget.
- 40) Does public debt impose a burden? Explain.
- 41) Write a note on balance of trade.

PART – D

VI. Answer **any four** of the following questions in **20** sentences **each**.
(4 × 6 = 24)

- 42) Explain the features of indifference curves with help of diagrams.
- 43) Explain market supply curve with the help of diagram.
- 44) Suppose the demand and supply curves of wheat are given by $q^D = 200 - P$, $q^S = 120 + P$.
 - a) Find the equilibrium price.
 - b) Find the equilibrium quantity of demand and supply.
 - c) Find the quantity of demand and supply when $P >$ equilibrium price.
 - d) Find the quantity of demand and supply when $P <$ equilibrium price.



- 45) Explain the short run equilibrium of a monopolist with the case of zero cost.
- 46) Explain the macro economic identities.
- 47) Explain the functions of money. How does money overcome the short comings of the barter system?
- 48) Write a short note on the Gold Standard.

PART – E

VII. Answer **any two** of the following Project oriented questions.

(2 × 5 = 10)

- 49) A Consumer wants to consume two goods. The price of Bananas is Rs.5 and price of Mangoes is Rs.10. The consumer income is Rs.40.
 - a) How many bananas can she consume if she spend her entire income on that good?
 - b) How many Mangoes can she consume if she spend her entire income on that good?
 - c) Is the slope of budget line downward or upward?
 - d) Are the bundles on the budget line equal to the consumer's income or not?
 - e) If you want to have more of Banana, you have to give up Mangoes. Is it true?



50) Find the missing products of the following table :

Factor I	TP	MP	AP
0	0	0	0
1	10	—	10
2	24	—	12
3	40	16	13.33
4	—	10	—
5	—	6	11.2
6	57	1	9.5

(For Blind students only)

Give the meaning of TP, MP and AP.

51) Name the currencies of **any five** countries of the following :

USA, UK, Germany, Japan, China, Argentina, UAE, Bangladesh, Russia.

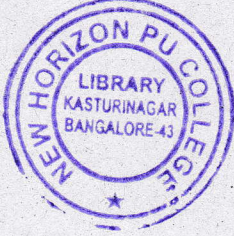


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M - 2023

Register Number :

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Subject Code : 27 (NS)

BUSINESS STUDIES

(Kannada and English Versions)

Time : 3 Hours 15 Minutes]

[Total No. of questions : 46]

[Max. Marks : 100

(Kannada Version)**ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು :**

1. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯು ಐದು ವಿಭಾಗಗಳನ್ನು ಒಳಗೊಂಡಿದೆ. ವಿಭಾಗ ಎ, ಬಿ, ಸಿ, ಡಿ ಮತ್ತು ಇ.
2. ವಿಭಾಗ 'ಎ' ನಾಲ್ಕು ಭಾಗಗಳನ್ನು ಹೊಂದಿದೆ. [I, II, III, IV]
3. ಉತ್ತರಿಸುವಾಗ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿರುವ ಪ್ರಶ್ನೆಗಳ ಕ್ರಮಸಂಖ್ಯೆಯನ್ನು ಸರಿಯಾಗಿ ಬರೆಯಿರಿ.
4. ಸರಿಯಾದ ಮತ್ತು ಪೂರ್ಣ ಉತ್ತರವನ್ನು ಬರೆಯಿರಿ.

ವಿಭಾಗ - ಎ

I. ಸರಿಯಾದ ಉತ್ತರವನ್ನು ಆರಿಸಿ ಬರೆಯಿರಿ.

(5 × 1 = 5)

1) ಈ ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದು ನಿರ್ವಹಣೆಯ ಒಂದು ಉದ್ದೇಶವಲ್ಲ?

- a) ಅಸ್ತಿತ್ವ
- b) ಲಾಭ ಗಳಿಸುವುದು
- c) ಸಂಘಟನೆಯ ಬೆಳವಣಿಗೆ
- d) ನೀತಿ ರೂಪಿಸುವುದು

P.T.O.

**(English Version)****Instructions to Candidates :**

1. The question papers contain 5 parts – Part A, Part B, Part C, Part D and Part E.
2. Part A consists of 4 sections. [I, II, III and IV].
3. Write the serial number of questions properly given in the question paper while answering.
4. Write the correct and complete answer.

PART – A

I. Choose the correct answer :

(5 × 1 = 5)

- 1) The following is not an objective of Management
 - a) Survival
 - b) Earning of profit
 - c) Growth of the organisation
 - d) Policy making
- 2) How are principles of management formed?
 - a) In a laboratory
 - b) By experiences of managers
 - c) By experiences of customers
 - d) By propagation of social scientists
- 3) Which of the following is not the feature of planning?
 - a) It focuses on achieving objectives
 - b) It involves identification and division of work
 - c) It is the primary function of the management
 - d) It is a pervasive function
- 4) Which of the following is not an element of delegation?
 - a) Accountability
 - b) Responsibility
 - c) Authority
 - d) Rights
- 5) Which of the following is a money market instrument?
 - a) Treasury bills
 - b) Debentures
 - c) Equity shares
 - d) Preference shares



II. Fill in the blanks by choosing appropriate word/words given in the brackets : **(5 × 1 = 5)**

(SEBI, Coordination, Fixed Assets, Job rotation, Budget)

- 6) _____ is the essence of Management.
- 7) A statement of expected results expressed in numerical terms is known as _____
- 8) The shifting of trainees from one department / job to another is known as _____
- 9) Fixed capital is invested in _____
- 10) Capital Market is controlled by _____

III. Match the following : **(5 × 1 = 5)**

- | 11) A | B |
|-------------------------------------|-------------------------------------|
| a) Decentralisation | i) Style of leadership |
| b) Preliminary screening | ii) Money market and capital market |
| c) Laissez Faire | iii) Quick decision making |
| d) Modern techniques of controlling | iv) Selection process |
| e) Financial Market | v) Management Information System |

IV. Answer the following questions in **one** word or **one** sentence **each** : **(5 × 1 = 5)**

- 12) Who advocated piece wage system?
- 13) Write any one feature of business environment.
- 14) Mention any one element of directing.
- 15) What is a brand?
- 16) State the monetary limit of claim in State Consumer Disputes Redressal Commission.

**PART – B**

V. Answer **any nine** of the following questions in **2 or 3** sentences each.

Each question carries **2** marks :

(9 × 2 = 18)

17) Define Management.

18) State any two differences between unity of command and unity of direction.

19) Give the meaning of Planning Premises.

20) What is formal organisation?

21) Mention any two demerits of internal sources of recruitment.

22) Write any two features of Motivation.

23) Give the meaning of breakeven analysis.

24) State the twin objectives of financial planning.

25) Mention any two money market instruments.

26) How do you describe marketing mix?

27) Write any two rights of consumers.



PART – C

VI. Answer **any seven** of the following questions in **10-12** sentences.
Each question carries **4** marks : **(7 × 4 = 28)**

- 28) Explain F.W. Taylor's Scientific Management Principles.
- 29) Briefly explain any four dimensions of business environment.
- 30) Explain the importance of planning with any four points.
- 31) Explain briefly four On-the-Job training methods.
- 32) Briefly explain the first four steps involved in controlling process.
- 33) What is capital budgeting decision? Explain briefly factors influencing capital budgeting decisions.
- 34) Explain any four factors affecting working capital requirements of an organisation.
- 35) State any four considerations to be kept in mind while choosing a brand name.
- 36) Explain any two advantages and two limitations of advertising.
- 37) State any four responsibilities of consumers while purchasing, using and consuming goods and services.

**PART – D**

VII. Answer **any three** of the following questions in **20-25** sentences each.
Each question carries **8** marks : **(3 × 8 = 24)**

- 38) Explain the characteristics of Management.
- 39) What is delegation? Explain the importance of delegation.
- 40) Explain the stages involved in staffing process.
- 41) Explain suitable measures to overcome barriers to effective communication.
- 42) What is stock exchange? Explain the functions of stock exchange.
- 43) What is Pricing? Explain the factors affecting price determination.

PART – E

VIII. Answer **any two** of the following questions. Each question carries **5** marks :
(2 × 5 = 10)

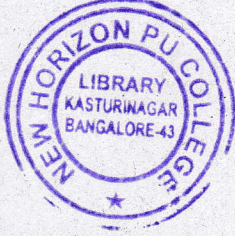
- 44) As a general manager, list out any ten Fayol's principles of Management which you would like to adopt in your business organisation.
 - 45) Draw the organisation chart showing divisional and functional structure.
 - 46) As a financial consultant, give the list of any ten factors which affect the choice of capital structure.
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Register Number :

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Subject Code : 30 (NS)

**ACCOUNTANCY**

(Kannada and English Versions)

Time : 3 Hours 15 Minutes]

[Total No. of questions : 41]

[Max. Marks : 100

(Kannada Version)

- ಸೂಚನೆಗಳು:
1. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯು ಎ, ಬಿ, ಸಿ, ಡಿ ಮತ್ತು ಇ ಭಾಗಗಳನ್ನು ಹೊಂದಿದೆ. ಭಾಗ-ಎ I, II, III ಮತ್ತು IV ವಿಭಾಗಗಳನ್ನು ಒಳಗೊಂಡಿದೆ.
 2. ಅಗತ್ಯವಿರುವ ಕಡೆ ಲೆಕ್ಕದ ಟಿಪ್ಪಣಿಗಳನ್ನು ಬರೆಯಿರಿ.
 3. ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಪ್ರಶ್ನೆಗಳನ್ನು ಓದಿಕೊಳ್ಳಲು 15 ನಿಮಿಷ ಅವಧಿಯನ್ನು ಹೆಚ್ಚುವರಿಯಾಗಿ ನೀಡಿದೆ.
 4. ಹಾಳೆಯ ಬಲಬದಿಯಲ್ಲಿ ಬರೆದಿರುವ ಸಂಖ್ಯೆಗಳು ಪೂರ್ಣ ಅಂಕಗಳನ್ನು ತೋರಿಸುತ್ತವೆ.

ಭಾಗ - ಎ

- I. ಕೊಟ್ಟಿರುವ ಆಯ್ಕೆಗಳಲ್ಲಿ ಸರಿಯಾದ ಉತ್ತರವನ್ನು ಆರಿಸಿ ಬರೆಯಿರಿ : (5 × 1 = 5)

1) ಲಾಭಕ್ಕಲ್ಲದ ಸಂಸ್ಥೆಗಳು ಇದಕ್ಕಾಗಿ ಸ್ಥಾಪನೆಯಾಗಿರುತ್ತವೆ.

- | | |
|-------------------|----------------------|
| a) ಲಾಭ | b) ಸೇವೆ |
| c) ಲಾಭ ಮತ್ತು ಸೇವೆ | d) ಮೇಲಿನ ಯಾವುದೂ ಅಲ್ಲ |

**(English Version)**

- Instructions :**
1. *The question paper contains Five parts A, B, C, D and E. Part – A consists of Four Sections I, II, III, and IV.*
 2. *Provide working notes wherever necessary.*
 3. *15 minutes extra has been allotted for candidates to read the questions.*
 4. *Figures in the right hand margin indicate full marks.*

PART – A

I. Choose the correct answer from the choices given :

(5 × 1 = 5)

- 1) Not-for-profit organisations are formed for
 - a) Profit
 - b) Service
 - c) Profit and Service
 - d) None of the above
- 2) Sanjaya, Gopi and Nikhil are partners sharing profits and losses in the ratio of 3 : 2 : 1. If Gopi retires, the new profit sharing ratio of Sanjaya and Nikhil will be
 - a) 3 : 1
 - b) 3 : 2
 - c) 2 : 1
 - d) None of the above
- 3) Issued capital is part of
 - a) Reserve capital
 - b) Unissued capital
 - c) Authorised capital
 - d) None of the above



- 4) Financial statements generally include
- Comparative statement
 - Fund flow statement
 - Statement of profit and loss and Balance Sheet
 - None of the above
- 5) Comparative statements are also known as
- Dynamic analysis
 - Horizontal analysis
 - Vertical analysis
 - External analysis
- II. Fill in the blanks by choosing the appropriate answers from those given in the brackets : (5 × 1 = 5)
- (Interest rate, complimentary, investing, unlimited, intangible)
- 6) The liability of a partner for acts of the firm is _____.
- 7) Goodwill is an _____ asset.
- 8) 1000, 10% debentures at par, here 10% means _____.
- 9) Analysis and interpretation are _____ to each other.
- 10) _____ activities relate to purchase and sale of fixed asset.
- III. Match the following : (5 × 1 = 5)
- | 11) | A | B |
|-----|----------------------------|------------------------------------------|
| a) | Current account | i) Reserves and surplus |
| b) | Sacrifice ratio | ii) 2013 |
| c) | Dissolution of partnership | iii) Fixed Capital system |
| d) | Companies Act | iv) Admission of a Partner |
| e) | Securities Premium | v) Closing down the business of the firm |



IV. Answer the following questions in **one** word or **one** sentence each :

(5 × 1 = 5)

- 12) State any one feature of Receipts and Payments account.
- 13) When do you prepare Executor's Account?
- 14) Expand D.R.R.
- 15) A ratio reflects quantitative and qualitative aspects of results. (State True/False).
- 16) What are operating activities?

PART – B

V. Answer **any five** questions. Each question carries 2 marks :

(5 × 2 = 10)

- 17) Give any two examples of not-for-profit organisation.
- 18) State any two contents of partnership deed.
- 19) What is fluctuating capital system?
- 20) Give the journal entry for transferring the assets to realisation account.
- 21) What is forfeiture of shares?
- 22) Write any two objectives of financial statements.
- 23) Name any two users of Financial Statement analysis.
- 24) State any two uses of cash flow statement.



PART – C

VI. Answer **any four** questions, each question carries **6** marks : (4 × 6 = 24)

25) Latha and Chethana are partners in a firm. Latha's drawings for the year 2021-22 are given as under ;

₹ 4,000 on 01.06.2021

₹ 6,000 on 30.09.2021

₹ 2,000 on 30.11.2021

₹ 3,000 on 01.01.2022

Calculate interest on Latha's drawings at 8% p.a. for the year ending on 31.03.2022, under Product Method.

26) Gireesh, Yogeesh and Harish are partners in a firm sharing profits and losses in the ratio of 4 : 3 : 2 respectively. Gireesh retires from the firm. Yogeesh and Harish agreed to share the future profits in the ratio of 5 : 3.

Calculate the Gain ratio of Yogeesh and Harish.

27) Akash, Anil and Ajay are partners in a firm sharing profits and losses in the ratio of 3 : 2 : 1. Their capitals as on 01.04.2021 were ₹ 70,000, ₹ 90,000 and ₹ 60,000 respectively. Akash died on 31.12.2021 and the partnership deed provided the following ;

a) Interest on Akash's capital at 10% p.a.

b) Akash's salary ₹ 3,000 per month

c) His share of accrued profit upto the date of his death based on previous year's profit. Firm's profit for the year 2020-21 was ₹ 24,000.

d) His share of Goodwill ₹ 12,000 (As per AS-26)

Prepare Akash's capital account.



PART – C

VI. Answer **any four** questions, each question carries **6** marks : **(4 × 6 = 24)**

25) Latha and Chethana are partners in a firm. Latha's drawings for the year 2021-22 are given as under ;

₹ 4,000 on 01.06.2021

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c) His share of accrued profit upto the date of his death based on previous year's profit. Firm's profit for the year 2020-21 was ₹ 24,000.

d) His share of Goodwill ₹ 12,000 (As per AS-26)

Prepare Akash's capital account.



- 28) Kumuda Company Ltd., issued 20,000, 10% debentures of ₹ 100 each payable as follows ;

₹ 20 on application

₹ 40 on allotment

₹ 40 on first and final call.

All the debentures were subscribed and the money duly received.

Pass the necessary journal entries to record the above transactions.

- 29) From the following information, prepare statement of Profit and Loss for the year ended 31.03.2022 as per Schedule-III of the Companies Act, 2013.

Particulars	₹
Revenue from operations	16,00,000
Cost of materials consumed	4,00,000
Salaries to Employees	1,50,000
Leave encashment	50,000
Interest on Debentures	50,000
Interest on Borrowings	25,000
Depreciation and Amortization	1,00,000
Tax	2,47,500

- 30) Calculate Current ratio and Quick ratio from the following information ;

Particulars	₹
Current Assets	2,40,000
Current Liabilities	60,000
Quick assets	1,20,000



31) From the following information, calculate Cash Flow from financing activities ;

Particulars	01.04.2021	31.03.2022
	₹	₹
Debentures	16,00,000	20,00,000
Preference Share Capital	6,00,000	10,00,000

During the year, the company redeemed debentures of ₹ 2,00,000.

PART – D

VII. Answer **any three** questions. Each question carries **12** marks : (3 × 12 = 36)

32) The following is the Balance Sheet and Receipts and Payments account of Unity Sports Club, Bengaluru.

Balance Sheet as on 01.04.2021

Liabilities	₹	Assets	₹
Outstanding salary	5,000	Cash at Bank	12,000
Capital fund	60,000	Outstanding subscription	3,000
		Sports material	30,000
		Furniture	20,000
	<u>65,000</u>		<u>65,000</u>

Receipts and Payments Account for the year ended 31.03.2022

Dr.				Cr.
	Receipts	₹	Payments	₹
	To Balance b/d	12,000	By Salary	20,000
	To Subscriptions	65,000	By Purchase of Sports material	15,000
	To Entrance fee	10,000	By Investment	25,000
	To Sale of old sports material	3,000	By Fixed deposit	20,000
	To Rent	12,500	By Postage	1,000
			By Electricity charges	2,500
			By Balance c/d	19,000
		<u>1,02,500</u>		<u>1,02,500</u>



Adjustments:

- Subscriptions outstanding for the year 2021-22 is ₹ 5,000
- Depreciate sports materials by ₹ 5,000
- Outstanding salary for 2021-22 ₹ 2,000
- Capitalise $\frac{1}{2}$ of the entrance fees

Prepare ;

- Income and Expenditure Account for the year ended 31.03.2022.
- Balance Sheet as on 31.03.2022.

- 33) Uma and Geetha are partners sharing profit and losses in the ratio of 3 : 2 respectively. Their Balance Sheet as on 31.03.2022 was as follows :

Balance Sheet as on 31.03.2022

Liabilities	₹	Assets	₹
Creditors	50,000	Cash	15,000
Bills payable	15,000	Stock	30,000
General Reserve	25,000	Debtors	45,000
Capital Account :		Investments	40,000
Uma	60,000	Furniture	10,000
Geetha	40,000	Building	50,000
	<u>1,90,000</u>		<u>1,90,000</u>

On 01.04.2022 they admit Kamala into partnership on the following terms ;

- Kamala should bring in ₹ 50,000 as capital for $\frac{1}{6}$ th share and ₹ 25,000 towards goodwill (As per AS-26)
- Depreciate furniture by 10% and appreciate building by ₹ 10,000
- Maintain P.D.D. at 5% on debtors
- Provide ₹ 2,000 for outstanding salary

Prepare ;

- Revaluation account
- Partner's capital account
- New balance sheet of the firm as on 01.04.2022.



- 34) Mohan and Manju are partners in a firm sharing profit and losses in the ratio of 3 : 2 respectively. Their Balance Sheet as on 31.03.2022 was as under :

Balance Sheet as on 31.03.2022

Liabilities	₹	Assets	₹
Creditors	30,000	Cash at Bank	10,000
Bills Payable	10,000	Bills Receivable	8,000
Mohan's loan	5,000	Debtors	30,000
Reserve Fund	15,000	Stock	17,000
Capital Account ;		Furniture	10,000
Mohan	60,000	Machinery	25,000
Manju	40,000	Building	60,000
	<u>1,60,000</u>		<u>1,60,000</u>

On the above date the firm was dissolved ;

- a) The assets were realized as follows ;

Bills receivable	₹ 6,500
Debtors	₹ 25,000
Stock	₹ 15,000
Machinery	₹ 22,000
Building	₹ 65,000

- b) Furniture was taken over by Manju for ₹ 9,000
c) All the liabilities were paid in full
d) Dissolution expenses ₹ 2,000

Prepare ;

- Realisation account
- Partner's capital account
- Bank account



35) Kalpatharu Company Ltd., issued 10,000 equity shares of ₹ 100 each at a premium of ₹ 10 per share. The amount was payable as follows ;

₹ 20 on application

₹ 50 on allotment (including premium)

₹ 40 on first and final call

All the shares were subscribed and the money duly received except the first and final call on 1,000 shares. The Directors forfeited these shares and re-issued them as fully paid up at ₹ 80 per share.

Pass the necessary journal entries in the books of the company.

36) Pass the journal entries for the following ;

- a) Issued 5,000, 12% debentures of ₹ 100 each at a premium of 10% and redeemable at par.
- b) Issued 5,000, 12% debentures of ₹ 100 each at a discount of 10% and redeemable at a premium of 10%
- c) Issued 5,000, 12% debentures of ₹ 100 each at a premium of 10% and redeemable at a premium of 10%
- d) Issued 5,000, 12% debentures of ₹ 100 each at a discount of 10% and redeemable at par.



- 37) From the following Balance Sheet of Union Company Ltd., prepare common size Balance Sheet as on 31.03.2021 and 31.03.2022 ;

Balance Sheet as on 31.03.2021 and 31.03.2022

Particulars	31.03.2021 ₹	31.03.2022 ₹
I. Equity and liabilities :		
1. Shareholders fund ;		
Share capital	10,00,000	16,00,000
Reserves and Surplus	3,00,000	5,00,000
2. Non-current liabilities ;		
Long term borrowings	4,00,000	3,00,000
3. Current liabilities ;		
Trade payables	2,00,000	4,00,000
Other current liabilities	1,00,000	2,00,000
Total	<u>20,00,000</u>	<u>30,00,000</u>
II. Assets :		
1. Non-current assets ;		
Fixed assets	6,00,000	10,00,000
Non-current investments	3,00,000	4,00,000
2. Current assets ;		
Inventories	5,00,000	7,00,000
Trade receivables	4,00,000	5,00,000
Cash and Cash equivalent	2,00,000	4,00,000
Total	<u>20,00,000</u>	<u>30,00,000</u>



38) The following information is related to a company as on 31st March, 2022;

Particulars	₹
Revenue from operations	10,00,000
Gross profit	2,00,000
Average inventory	1,00,000
Net credit revenue from operations	6,00,000
Average trade receivables	1,50,000
Net credit purchases	5,00,000
Average trade payables	2,50,000
Operating expenses	1,00,000
Net profit	1,00,000

Calculate ;

- Inventory turnover ratio
- Trade receivable turnover ratio
- Trade payable turnover ratio
- Gross profit ratio
- Operating ratio
- Net profit ratio

PART – E

(Practical Oriented Questions)

VIII. Answer **any two** questions. Each question carries 5 marks :

(2 × 5 = 10)

39) Classify the following into Capital and Revenue :

- Legacies
- Subscriptions received
- Cost of computer purchased
- Honorarium paid
- Donation received for constructing a swimming pool.

40) Prepare Executor's loan account with imaginary figures showing the repayment in two annual equal installments along with interest.

41) Prepare comparative statement of profit and loss with five imaginary figures.



Register Number :

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Subject Code : 31 (NS)

**STATISTICS**

(Kannada and English Versions)

Time : 3 Hours 15 Minutes]

[Total No. of questions : 44]

[Max. Marks : 100

(Kannada Version)

ಸೂಚನೆಗಳು:

1. ಸಾಂಖ್ಯಿಕ ಕೋಷ್ಟಕ ಮತ್ತು ಆಲೇಖ ಕಾಗದಗಳನ್ನು ವಿನಂತಿಯ ಮೇರೆಗೆ ಪೂರೈಸಲಾಗುವುದು.
2. ವೈಜ್ಞಾನಿಕ ಗಣಕೋಪಕರಣಗಳನ್ನು ಉಪಯೋಗಿಸಲು ಅವಕಾಶವಿದೆ.
3. ಕಾರ್ಯದ ಎಲ್ಲಾ ಹಂತಗಳನ್ನು ಸ್ಪಷ್ಟವಾಗಿ ತೋರಿಸತಕ್ಕದ್ದು.

ವಿಭಾಗ - ಎ

I. ನೀಡಿರುವ ಆಯ್ಕೆಗಳಿಂದ ಸರಿಯಾದ ಉತ್ತರವನ್ನು ಆರಿಸಿರಿ :

(5 × 1 = 5)

- 1) ಮಾನವ ಜನಸಂಖ್ಯೆಯ ಅಂಕಿ ಅಂಶಗಳ ಅಧ್ಯಯನವನ್ನು ಹೀಗೆಂದು ಕರೆಯಲಾಗುತ್ತದೆ.
 - a) ಜೀವಶಾಸ್ತ್ರ
 - b) ಸಮಾಜಶಾಸ್ತ್ರ
 - c) ಜನಸಂಖ್ಯಾಶಾಸ್ತ್ರ
 - d) ಮನೋವಿಜ್ಞಾನ
- 2) 2015 ಮತ್ತು 2022 ರ ನಡುವೆ ಸಾಮಾನ್ಯ ಬೆಲೆ ಮಟ್ಟವು 70% ರಷ್ಟು ಹೆಚ್ಚಾದರೆ 2022 ರ ಸೂಚ್ಯಂಕ ಸಂಖ್ಯೆಯು,
 - a) 30
 - b) 70
 - c) 100
 - d) 170

P.T.O.



II. Match the following.

(5 × 1 = 5)

- | | |
|---------------------------------------------|----------------------------|
| 6) a) Method of collecting vital statistics | i) Time reversal test |
| b) $P_{01} \times P_{10} = 1$ | ii) Statistic |
| c) $Z_1^2 + Z_2^2$ | iii) Shortages are allowed |
| d) Function of sample values | iv) Census enumeration |
| e) Model-II | v) Chi-square |

III. Fill in the blanks by choosing the appropriate word from those given in the brackets : (5 × 1 = 5)

[Chance causes, Geometric mean, Sample mean, first quadrant, 5]

- 7) _____ is considered as the best average in the construction of index numbers.
- 8) In a chi-square distribution if variance is 10, then mean is _____
- 9) _____ is the best estimator of population mean.
- 10) _____ type of cause of variation cannot be detected by statistical quality control.
- 11) In a graphical solution of a linear programming problem, feasible region lies in _____



IV. Answer the following questions :

(5 × 1 = 5)

- 12) What do you mean by 'Radix' in a life table?
- 13) Which weights are used in the construction of Paasche's quantity index number?
- 14) Name the graph used in representing time series data.
- 15) What is the value of coefficient of skewness (β_1) of t-distribution?
- 16) When is a transportation problem unbalanced?

SECTION – B

V. Answer **any five** of the following questions :

(5 × 2 = 10)

- 17) State two norms for the selection of base year in the construction of an index number.
- 18) Write two conditions of least squares method of measuring trend.
- 19) Define 'Interpolation' and 'Extrapolation'.
- 20) Write the Bernoulli distribution with parameter $p = \frac{2}{5}$.
- 21) If $\sigma = 14$ cm and $n = 49$, then find standard error of sample mean.
- 22) Define type-I and type-II errors.
- 23) If $\bar{X}' = 25$, $\sigma' = 2$ and $n = 4$, then find the lower control limit for \bar{X} -chart.
- 24) Calculate the economic order quantity, when $R = 200$ units/year, $C_1 = ₹ 2/\text{unit/year}$ and $C_3 = ₹ 50/\text{cycle}$.



SECTION – C

VI. Answer **any eight** of the following questions : (8 × 5 = 40)

25) Calculate the 'Gross Reproduction Rate' for the following data.

Age group (in years)	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Female population	8000	11000	15000	20000	15000	6000	5000
Female births	320	660	1350	2000	1035	180	55

26) Calculate the simple geometric mean price index number for the following data.

Items	Price (in ₹)	
	Base year	Current year
A	20	25
B	25	30
C	30	25
D	10	08

27) Define the consumer price index number and mention its four steps involved in the construction of consumer price index number.

28) Find the trend values for the following time series by using three yearly moving averages and write your conclusion.

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Profit (in crores ₹)	30	27	39	36	42	48	45	51	48	54



- 29) Interpolate and extrapolate the production for the years 2018 and 2021 from the following data.

Year	2016	2017	2018	2019	2020	2021
Production (in 000's tons)	10	18	–	40	54	–

- 30) A typist makes 2 mistakes per page on an average. Find the probability that a page typed by him has,
- a) 2 mistakes
 - b) At the most 1 mistake.

- 31) There are 12 fruits in a basket, out of which 4 are mangoes and the rest are oranges. A boy picks 3 fruits at a random from the basket. Find the mean and variance of the number of oranges.

- 32) Test whether there is any significant difference between mean weight of boys and mean weight of girls at $\alpha = 1\%$ for the following data.

	Boys	Girls
Mean Weight	50	54
Standard Deviation	8	12
Sample Size	64	48

- 33) It is required to test whether those who practise yoga have average blood sugar less than 120. A sample consisting of 17 persons who practise yoga is observed. If their mean blood sugar is 108 and standard deviation is 8, what would you conclude?

(Use 5% level of significance).



- 34) Twenty rolls of different types of cloth contained the following number of defects in each roll :

8	3	1	2	5	4	7	6	2	5
3	2	7	6	5	4	3	2	1	4

Calculate the control limits for C-chart.

- 35) Solve the following Linear programming problem graphically :

Minimize : $Z = 5x + 8y$

Subject to constraints :

$$3x + 2y \leq 18$$

$$4x + 3y \geq 12$$

$$\text{and } x, y \geq 0$$

(For Visually Challenged Students only)

Write the steps in the graphical method of solving linear programming problem.

- 36) Solve the following game by using the principle of dominance.

		Player – B		
		B ₁	B ₂	B ₃
Player – A	A ₁	6	12	7
	A ₂	7	9	8
	A ₃	5	8	9
	A ₄	3	6	10

**SECTION – D**

VII. Answer **any two** of the following questions :

(2 × 10 = 20)

- 37) Calculate the standardized death rates of two cities given below and comment.

Age-group (in years)	City – A		City – B		Standard population
	Population	Deaths	Population	Deaths	
0-20	4,000	68	8,000	160	6,000
20-40	9,000	54	13,000	39	12,000
40-60	7,000	91	10,000	130	8,000
60 and above	3,000	129	4,000	160	4,000

- 38) Calculate Laspeyre's, Paasche's and Dorbish-Bowley's price index numbers from the following data.

Items	2017		2021	
	Price (in ₹)	Quantity	Price (in ₹)	Quantity
A	10	05	12	04
B	15	08	18	07
C	06	03	04	05
D	03	04	03	05

- 39) Fit a second degree trend of the form $y = a + bx + cx^2$ by the method of least squares and estimate the sales for 2022 for the following time series data.

Year	2017	2018	2019	2020	2021
Sales (in 000's ₹)	50	30	10	30	60

- 40) a) Five unbiased coins are tossed 256 times. Find the theoretical frequencies for the number of tails obtained. (5)

- b) A die is thrown 120 times and the results are as follows :

Face of a die	1	2	3	4	5	6
Frequency	12	18	20	32	20	18

Test whether the die is fair at 5% level of significance.

(5)



SECTION – E

VIII. Answer **any two** of the following questions :

(2 × 5 = 10)

- 41) The weight of 1,000 students are normally distributed with mean 55 kg's and standard deviation 3 kg's. Find the number of students with weight between 46 kg's and 64 kg's.
- 42) From a random sample of 100 students of P.U.C, 13 students were found wearing spectacles. Can we conclude that proportion of students wearing spectacles is more than 0.1? (use $\alpha=0.05$).
- 43) Test whether 'Smoking' and 'Literacy' are independent at 1% level of significance for the following data.

	Literates	Illiterates
Smoking	07	18
Non-smoking	13	12

- 44) Price of a machine is ₹ 8,000. Its maintenance cost and resale price at different years are given below,

Year	1	2	3	4	5	6
Maintenance cost (in ₹)	1500	1600	1800	2100	2500	3000
Resale price (in ₹)	4000	3000	2400	1800	1400	1000

Find the best age to replace the machine.



Register Number :

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Subject Code : 41 (NS)

**COMPUTER SCIENCE**

(Kannada and English Versions)

Time : 3 Hours 15 Minutes]

[Total No. of questions : 47]

[Max. Marks : 70

(Kannada Version)

ಭಾಗ - A

ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ. ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೆ ಒಂದು ಅಂಕ.

I. ಕೊಟ್ಟಿರುವ ಆಯ್ಕೆಗಳಲ್ಲಿ ಸರಿಯಾದುದನ್ನು ಆರಿಸಿ ಬರೆಯಿರಿ.

(20 × 1 = 20)

1) _____ ಅನ್ನು ಪ್ರಿಂಟರ್, ಕೀಬೋರ್ಡ್ ಮತ್ತು ಸ್ಕ್ಯಾನರ್‌ನಂತಹ ಬಾಹ್ಯ ಉಪಕರಣಗಳನ್ನು ಕಂಪ್ಯೂಟರಿಗೆ ಅಳವಡಿಸಲು ಉಪಯೋಗಿಸುತ್ತಾರೆ.

a) ಸ್ಲಾಟ್‌ಗಳು

b) ಪೋರ್ಟ್‌ಗಳು

c) ಬಸ್

d) ಕಂಟ್ರೋಲರ್‌ಗಳು

2) ಇನ್ವೆಲ್ಯೂಷನ್ ಲಾ ದ ಹೇಳಿಕೆಯನ್ನು ಕೊಡಿ.

a) $\overline{\overline{X}} = X$ b) $X \cdot X = X$ c) $X + X = X$ d) $\overline{\overline{X}} = 0$

3) _____ ದ್ವಾರವನ್ನು ಇನ್‌ವರ್ಟರ್ ಎಂದು ಕರೆಯುತ್ತಾರೆ.

a) OR

b) AND

c) NOT

d) NAND



(English Version)

PART – A

Answer **ALL** the questions. **Each** question carries **1** mark.

(20 × 1 = 20)

I. Select the correct answer from the choices given.

- 1) _____ are used to connect external devices like printers, keyboards, scanners to the computer.
 - a) Slots
 - b) Ports
 - c) Bus
 - d) Controllers
- 2) Involution law states that
 - a) $\overline{\overline{X}} = X$
 - b) $X \cdot X = X$
 - c) $X + X = X$
 - d) $\overline{\overline{X}} = 0$
- 3) _____ gate is also called an Inverter.
 - a) OR
 - b) AND
 - c) NOT
 - d) NAND
- 4) _____ is the process of accessing each data item atleast once to perform some operation.
 - a) Traversing
 - b) Insertion
 - c) Deletion
 - d) Sorting
- 5) _____ operator is used to define member function outside the class
 - a) ::
 - b) ;
 - c) .
 - d) :
- 6) Friend function is a _____
 - a) Member function
 - b) Non-member function
 - c) Main function
 - d) Recursive function



- 7) _____ is a special function that is used to initialize the objects of a class automatically.
- a) Constructor
 - b) Non-member function
 - c) Inline function
 - d) Friend function
- 8) Derived class is called _____
- a) Sub class
 - b) Super class
 - c) Main class
 - d) First class
- 9) Which of the following is the correct way to declare a pointer?
- a) `int *ptr`
 - b) `int ptr`
 - c) `int & ptr`
 - d) All of the above
- 10) Row in a table is called _____
- a) Relation
 - b) Attribute
 - c) Degree
 - d) Tuple
- 11) _____ command is used to delete entire table in SQL.
- a) Alter
 - b) Create
 - c) Drop
 - d) Delete
- 12) URL stands for _____
- a) Uniform Resource Location
 - b) Uniform Resource Locator
 - c) Uniform Reservation Location
 - d) Uniform Road Location
- 13) _____ is a device that connects dissimilar networks.
- a) Gateway
 - b) Bridge
 - c) Hub
 - d) Switch



14) _____ is a collection of computer networks all over the world.

- | | |
|-------------|---------------|
| a) Intranet | b) Internet |
| c) Telnet | d) Interspace |

15) _____ is a collection of web pages.

- | | |
|------------|------------|
| a) Package | b) Domain |
| c) Server | d) Website |

II. Fill in the blanks choosing the appropriate word/words from those given in the brackets.

(Security, Primary key, Diamond, Schema, Redundancy)

16) The structure of database is called as _____.

17) _____ is the symbol used to represent relationship in E-R diagram.

18) _____ uniquely identifies each record in a table.

19) Protection of data is the _____.

20) Data duplication is called as _____.

PART – B

III. Answer **any four** questions. **Each** question carries **2** marks.

(4 × 2 = 8)

21) Prove $X + XY = X$ algebraically.

22) Define minterm and maxterm.

23) Give any two applications of OOP.



- 24) Mention any two features of parameterized constructor.
- 25) Differentiate between read() and write() with respect to files.
- 26) Define (a) Data (b) Information.
- 27) Give the syntax and example for UPDATE command in SQL.
- 28) Briefly explain circuit switching technique.

PART – C

IV. Answer **any four** questions. **Each** question carries **3** marks. (4 × 3 = 12)

- 29) Explain cache memory.
- 30) What is principle of duality? Give an example.
- 31) What is a stack? Write an algorithm for PUSH operation.
- 32) What is an array of pointer? Give example.
- 33) What is a file? Differentiate between text file and binary file.
- 34) Explain any three features of database management system.
- 35) Mention any three technologies and services used in e-commerce.
- 36) Give the features of DHTML.



PART – D

V. Answer **any six** questions. **Each** question carries **5** marks. **(6 × 5 = 30)**

- 37) Given the Boolean function $f(A, B, C, D) = \Sigma(0, 1, 2, 3, 4, 8, 12, 13)$
Reduce it by using K-map.
- 38) Write an algorithm to SORT elements of an array in ascending order using insertion sort method.
- 39) Explain the operations on queue data structure.
- 40) Mention any five advantages of object oriented programming.
- 41) Explain member function outside class definition. Give an example.
- 42) Mention the characteristics of friend function.
- 43) Define destructor. Explain with syntax and example.
- 44) Mention the advantages of inheritance.
- 45) Explain data processing cycle.
- 46) Explain the following with an example.
- | | |
|------------|----------|
| a) COUNT() | b) MAX() |
| c) MIN() | d) AVG() |
| e) SUM() | |
- 47) Explain Computer network security in detail.
-

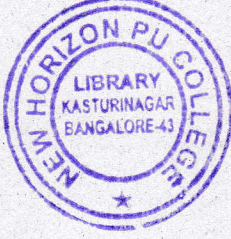


1585270

M - 2023

Register Number :

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Subject Code : 75 (NS)

BASIC MATHEMATICS

(Kannada and English Versions)

Time : 3 Hours 15 Minutes]

[Total No. of questions : 60]

[Max. Marks : 100

(Kannada Version)

ಸೂಚನೆಗಳು : 1. ಈ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಎ, ಬಿ, ಸಿ, ಡಿ ಮತ್ತು ಇ ಎಂಬ 5 ಭಾಗಗಳಿವೆ.

2. ಭಾಗ - ಎ ಗೆ 20 ಅಂಕಗಳು

ಭಾಗ - ಬಿ ಗೆ 18 ಅಂಕಗಳು

ಭಾಗ - ಸಿ ಗೆ 27 ಅಂಕಗಳು

ಭಾಗ - ಡಿ ಗೆ 25 ಅಂಕಗಳು

ಭಾಗ - ಇ ಗೆ 10 ಅಂಕಗಳು.

3. ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆಗಳನ್ನು ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ನಮೂದಿಸಿರುವಂತೆ ಬರೆಯಿರಿ.

ಭಾಗ - ಎ

I. ಈ ಕೆಳಗಿನ ಎಲ್ಲಾ ಹತ್ತು ಬಹು ಆಯ್ಕೆ ಪ್ರಶ್ನೆಗಳಲ್ಲಿ ಸರಿಯಾದ ಉತ್ತರವನ್ನು ಆರಿಸಿ ಬರೆಯಿರಿ : (10 × 1 = 10)

1) $A = \begin{bmatrix} 1 & -3 \\ 2 & 4 \end{bmatrix}$ ಆದರೆ $2A$ ಮಾತೃಕೆಯ ಬೆಲೆಯು ಏನು?

a) $\begin{bmatrix} 2 & -6 \\ 4 & 8 \end{bmatrix}$

b) $\begin{bmatrix} 2 & 4 \\ -6 & 8 \end{bmatrix}$

c) $\begin{bmatrix} 8 & -6 \\ 4 & 2 \end{bmatrix}$

d) $\begin{bmatrix} 2 & 4 \\ 1 & -3 \end{bmatrix}$

P.T.O.



(English Version)

- Instructions :**
1. The question paper has 5 parts A, B, C, D and E.
 2. Part – A carries 20 marks, Part – B carries 18 marks, Part – C carries 27 marks, Part – D carries 25 marks, Part – E carries 10 marks.
 3. Write the question number properly as indicated in the question paper.

PART – A

I. Answer all the **ten** multiple choice questions :

(10 × 1 = 10)

1) If $A = \begin{bmatrix} 1 & -3 \\ 2 & 4 \end{bmatrix}$ then the matrix $2A$ will be

a) $\begin{bmatrix} 2 & -6 \\ 4 & 8 \end{bmatrix}$

b) $\begin{bmatrix} 2 & 4 \\ -6 & 8 \end{bmatrix}$

c) $\begin{bmatrix} 8 & -6 \\ 4 & 2 \end{bmatrix}$

d) $\begin{bmatrix} 2 & 4 \\ 1 & -3 \end{bmatrix}$

2) The value of $\begin{vmatrix} 3200 & 3201 \\ 3202 & 3203 \end{vmatrix}$ is

a) 4

b) 0

c) -2

d) 2

3) How many different arrangements can be made with the letters of the word "MONDAY"?

a) 24

b) $6P_4$

c) 720

d) 6



4) In how many ways can 10 people be seated around a table?

a) $10!$

b) $9!$

c) $8!$

d) $7!$

5) Given $p : 3x = 9$, $q : x < 7$ then, symbolic form of

" $3x = 9$ or $x < 7$ " is

a) $p \vee q$

b) $\sim p \vee q$

c) $p \wedge q$

d) $p \vee \sim q$

6) The duplicate ratio of 2:3 is

a) $8 : 27$

b) $3 : 2$

c) $4 : 9$

d) $9 : 4$

7) If $\sin A = \frac{1}{2}$ then the value of $\cos 2A$ is

a) $\frac{1}{2}$

b) $\frac{1}{3}$

c) $\frac{1}{4}$

d) $\frac{\sqrt{3}}{2}$

8) The centre of the circle $x^2 + y^2 - 4x - y - 5 = 0$ is

a) $(2, 1)$

b) $\left(2, \frac{1}{2}\right)$

c) $\left(1, \frac{1}{2}\right)$

d) $(1, 2)$



4) In how many ways can 10 people be seated around a table?

a) $10!$

b) $9!$

c) $8!$

d) $7!$

5) Given $p : 3x = 9$, $q : x < 7$ then, symbolic form of

" $3x = 9$ or $x < 7$ " is

a) $p \vee q$

b) $\sim p \vee q$

c) $p \wedge q$

d) $p \vee \sim q$

6) The duplicate ratio of 2:3 is

a) $8 : 27$

b) $3 : 2$

c) $4 : 9$

d) $9 : 4$

7) If $\sin A = \frac{1}{2}$ then the value of $\cos 2A$ is

a) $\frac{1}{2}$

b) $\frac{1}{3}$

c) $\frac{1}{4}$

d) $\frac{\sqrt{3}}{2}$

8) The centre of the circle $x^2 + y^2 - 4x - y - 5 = 0$ is

a) $(2, 1)$

b) $\left(2, \frac{1}{2}\right)$

c) $\left(1, \frac{1}{2}\right)$

d) $(1, 2)$



9) If $y = 5e^x - \log x - 3\sqrt{x}$ then $\frac{dy}{dx}$ is

a) $5e^x - \frac{1}{x} - \frac{3}{2\sqrt{x}}$

b) $5e^x - \frac{1}{x^2} - \frac{3\sqrt{x}}{2}$

c) $5e^x - x - \frac{3}{2\sqrt{x}}$

d) $5e^x - \frac{1}{x} - 3\sqrt{x}$

10) The value of $\int \frac{5}{x} dx$ is

a) $5\log x + C$

b) $\frac{-5}{x^2} + C$

c) $\log x + C$

d) $\frac{1}{5}\log x + C$

II. Fill in the blanks by choosing the appropriate answer from the brackets given below : (5 × 1 = 5)

(35, 4500, 9, 5%, $\frac{19}{2}$)

11) If ${}^nC_4 = {}^nC_5$ then, the value of n is _____

12) The fourth proportional of 6, 14, 15 is _____

13) The amount of stock that can be bought for ₹ 3,375 at ₹ 75 is _____

14) Rama paid ₹ 60 as sales tax on a Titan Rag watch worth ₹ 1,200 then the rate of sales tax is _____

15) The value of $\lim_{x \rightarrow 4} \left(\frac{4x+3}{x-2} \right)$ is _____



III. Answer **all** the following questions :

(5 × 1 = 5)

- 16) Negate : $\sim p \rightarrow q$
- 17) A bill was drawn on 14 – 3 – 2013 for 3 months find the legally due date.
- 18) Define learning index.
- 19) If the length of the latus rectum of $x^2 = 4ky$ is 8, find the value of k .
- 20) If the total cost of an article is $C = x^2 + 5x + 7$ where x indicates quantity, find its marginal cost.

PART – B

IV. Answer **any nine** questions :

(9 × 2 = 18)

- 21) If $A = \begin{bmatrix} 2 & -1 \\ 1 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} -3 & 2 \\ -1 & 4 \end{bmatrix}$ find $(AB)'$.
- 22) In how many ways can 6 boys and 6 girls be arranged in a row so that
- a) All girls are together
 - b) All boys are not together
- 23) Two fair coins are tossed simultaneously. Find the probability of
- a) getting two heads
 - b) atleast one head
- 24) If the compound proposition $p \rightarrow (q \vee r)$ is false, then find the truth values of p , q and r .



25) A ratio in the lowest terms is 3 : 7. If the difference between the quantities is 24. Find the quantities.

26) Banker's Discount and Banker's Gain on a certain bill due after some time are ₹927 and ₹27 respectively, find the face value of the bill.

27) If $\cos A = \frac{4}{5}$ find $\cos 3A$.

28) If $\tan A = \frac{3}{4}$ and $\tan B = \frac{1}{7}$ show that $A + B = \frac{\pi}{4}$.

29) Find the equation of the parabola given that vertex is (0, 0) and focus (3, 0).

30) If $f(x) = \begin{cases} \frac{x^4 - 256}{x - 4}, & x \neq 4 \\ a, & x = 4 \end{cases}$ is continuous at $x = 4$, find a .

31) If $y = x^{5+\log x}$ find $\frac{dy}{dx}$.

32) The displacement 's' of a particle at time 't' is given by $s = 2t^3 - 5t^2 + 4t - 3$ find the velocity at time $t = 2$ seconds.

33) Evaluate : $\int \frac{2x+5}{x^2+5x+3} dx$.

34) Evaluate : $\int_1^2 \left(2x^2 + \frac{1}{x} \right) dx$



PART - C

V. Answer **any nine** questions :

(9 × 3 = 27)

35) Solve using Cramer's Rule :

$$3x + 2y = 8$$

$$4x - 3y = 5$$

36) Prove that
$$\begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{vmatrix} = (a-b)(b-c)(c-a)$$

37) A team of 8 players has to be selected from 14 players. In how many ways the selections can be made if

- a) Two particular players are always selected
- b) Two particular players are always excluded
- c) Any 8 players are selected from 14 players.

38) A card is drawn from a pack of 52 playing cards. What is the probability that the card is king given that the card is red?

39) Two taps can separately fill a tank in 12 minutes and 15 minutes separately. The tank when full can be emptied by a drain pipe in 20 minutes when the tank was empty, all the three taps were opened simultaneously. In what time will the tank be filled up?

40) A bill for ₹ 2,920 drawn at 6 months was discounted on 10-4-97 for ₹ 2,916. If the discount rate is 5% p.a. On what date was the bill drawn?

41) What is the market value of 12% stock when an investment of ₹ 6,900 produces an income of ₹ 720.

42) Gopal purchased a scooter costing ₹ 32,450. If the rate of sales tax is 9%, calculate the total amount payable by him.

43) Find, directrix, focus and vertex of the parabola $y^2 = 8x$.



- 44) If $x = a\theta$, $y = \frac{a}{\theta}$ then, prove that $\frac{dy}{dx} + \frac{y}{x} = 0$.
- 45) A square plate is expanding uniformly, the side is increasing at the rate of 5 cm/sec, what is the rate at which the area is increasing when the side is 20 cm long?
- 46) Divide the number 40 into two parts such that their product is maximum.
- 47) Evaluate : $\int x \cos x \, dx$.
- 48) Evaluate : $\int_0^1 (6x+1)\sqrt{3x^2+x+5} \, dx$.

PART – D

VI. Answer **any five** questions :

(5 × 5 = 25)

- 49) Solve the following system of linear equations by matrix method.

$$3x - y + 2z = 13$$

$$2x + y - z = 3$$

$$x + 3y - 5z = -8$$

- 50) Find the coefficient of x'' in $\left(x + \frac{2}{x^2}\right)^{17}$.

- 51) Resolve $\frac{3x+2}{(x-2)(x+3)^2}$ into partial fractions.

- 52) Verify whether the proposition $(p \wedge \sim q) \wedge (\sim p \vee q)$ is a contradiction or not.

- 53) If two men and four women can do a work in 33 days and 3 men and 5 women can do the same work in 24 days. How long shall 5 men and 2 women do the same work?



54) An engineering company has 80% learning effect and spends 800 hours to produce 1 lot of the product. Estimate the labour cost for producing 8 lots of the product at the rate of ₹ 20 per hour.

55) Solve the following LPP graphically :

$$\text{Maximize : } Z = 10500x + 9000y,$$

$$\text{Subject to the constraints : } 2x + y \leq 80$$

$$x + y \leq 50$$

$$\text{and } x \geq 0, y \geq 0.$$

56) Prove that :

$$\frac{\sin 5A + \sin 4A + \sin 2A + \sin A}{\cos 5A + \cos 4A + \cos 2A + \cos A} = \tan 3A.$$

57) If $y = \log(x + \sqrt{x^2 + 1})$, show that $(x^2 + 1)y_2 + xy_1 = 0$.

58) Find the area bounded by the parabola $y^2 = 4x$ and the line $x - y = 0$.

PART - E

VII. Answer the following :

59) a) Show that the points (0, 0), (1, 1), (5, -5) and (6, -4) are concyclic. (6)

OR

b) If the angle ' θ ' is measured in radians. Prove that $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$. (6)

60) a) The angle of elevation of the top of a tower from the base and the top of a building are 60° and 30° . The building is 20 m high. Find the height of the tower. (4)

OR

b) Find the value of $(1.01)^5$ using Binomial theorem, upto 4 decimal places. (4)