

**11N505**

Roll No. \_\_\_\_\_

Total No of Pages: **3****11N505****B. Tech. I - Sem. (New Scheme) Main Exam., July - 2022  
1FY3 - 05 Managerial Economics and Financial Accounting  
Common to all Branches****Time: 2 Hours****Maximum Marks: 70****Min. Passing Marks:****Instructions to Candidates:**

**Part - A:** Short answer questions (up to 25 words)  $5 \times 3$  marks = 15 marks. Candidates have to answer 5 questions out of 10.

**Part - B:** Analytical/Problem Solving questions  $3 \times 5$  marks = 15 marks. Candidates have to answer 3 questions out of 7.

**Part - C:** Descriptive/Analytical/Problem Solving questions  $2 \times 20$  marks = 40 marks. Candidates have to answer 2 questions out of 5.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)

1. Simple Calculator2. NIL**PART- A**

- ~~Q.1~~ Explain inflation briefly.
- Q.2 What is economies of scale?
- ~~Q.3~~ Define law of supply.
- ~~Q.4~~ Explain cross elasticity of demand.
- ~~Q.5~~ Define marginal cost.
- Q.6 What do you mean by going concern concept?

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Q.7 Give significance of working capital ratio.

Q.8 Define margin of safety.

Q.9 What do you understand by sleeping partner?

~~Q.10~~ Enlist methods of demand forecasting.

### **PART- B**

Q.1 Define scarcity and opportunity cost. What role do these two concepts play in the making of management decisions?

Q.2 You are given following individual demand details for the product XYZ.

P	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>
37	20	4	8
47	15	2	7
57	10	0	6
67	5	0	5

(I) Determine the market demand table.

(II) Graph the individual and market demand curves.

Q.3 Distinguish between accounting profit and economics profit.

Q.4 Explain concept and use of break-even analysis.

~~Q.5~~ Explain oligopoly briefly.

Q.6 What do you understand by Sole Proprietorship firm?

Q.7 Define followings -

(a) Balance sheet

(b) Revenue

(c) Creditors

(d) Current assets

## PART-C

- Q.1 State and explain the law of diminishing marginal returns.
- Q.2 Distinguish between fixed and variable costs. Explain the shape of the average fixed cost curve, average variable cost curve and the marginal cost curve.
- Q.3 Elucidate chief characteristics, advantages and disadvantages of Partnership Firm.
- Q.4 Explain importance and limitations of ratio analysis in detail.
- Q.5 Journalize the following transactions in the books of Laxman.

	₹
Business started with cash	80,000
Purchased furniture from Modern Furnishers for cash	10,000
Deposited in bank	30,000
Purchased goods for cash	5,000
Purchased goods on credit from Hari	4,500
Purchased goods from Suresh for cash	3,000
Purchased goods from Ajay	4,000
Sold goods for cash	7,000
Sold goods to Karim	6,500
Sold goods to Ganesh for cash	5,000
Sold goods to Bansi	3,500
Withdrew from bank for office use	5,000
Karim paid on account	5,000
Paid rent for residence	6,000
Paid to Ajay in settlement of his account	3,800

**11N506**

Roll No. \_\_\_\_\_

Total No of Pages: **2****11N506****B. Tech. I - Sem. (New Scheme) Main Exam., July – 2022  
1FY2 – 06 Introduction to Built Environment (Civil)  
Common to all Branches****Time: 2 Hours****Maximum Marks: 70****Min. Passing Marks:****Instructions to Candidates:**

*Part – A: Short answer questions (up to 25 words) 5 × 3 marks = 15 marks. Candidates have to answer 5 questions out of 10.*

*Part – B: Analytical/Problem Solving questions 3 × 5 marks = 15 marks. Candidates have to answer 3 questions out of 7.*

*Part – C: Descriptive/Analytical/Problem Solving questions 2 × 20 marks = 40 marks. Candidates have to answer 2 questions out of 5.*

*Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)*

1. NIL2. NIL**PART– A**

- Q.1 Write importance of built environment.  
Q.2 Define Internet of Thing towards built environment.  
Q.3 What are the benefits of irrigation?  
Q.4 What are the elements of built environment?  
Q.5 What is meant by seasoning of timber?  
Q.6 What are the different types of brick masonry?

- Q.7 What do you understand by energy flow in eco-system?  
Q.8 What are the ingredients of concrete and their functions?  
Q.9 Write objectives of building planning.  
Q.10 What are the benefits of green building?

### **PART- B**

- Q.1 Write role of transportation with respect to socio – economic conditions.  
Q.2 Explain building components and their basic requirements.  
Q.3 Describe Internet of Things for the smart built environment.  
Q.4 Explain various types of foundation with sketches.  
Q.5 Describe various types of buildings. Also write concept of sunlight and ventilation.  
Q.6 Explain functional concepts of Ecology.  
Q.7 What are the causes of water pollution? Explain reuse and saving of water.

### **PART-C**

- Q.1 What is the modern world approach towards Built Environment? Explain in detail by giving examples.  
Q.2 Describe civil engineering divisions and their roles in built environment.  
Q.3 Explain various steps of building planning. Also discuss building bye-laws and their role in controlled development of built-environment.  
Q.4 What do you understand by building physics? Discuss thermal and lighting aspects of building.  
Q.5 Write short notes on any four -  
(a) 3D Printed Building  
(b) Road traffic signs  
(c) Rain-water harvesting  
(d) Hydrological cycle  
(e) Field-water storage structures  
(f) Conventional constructions

**11N501**

Roll No. \_\_\_\_\_

Total No of Pages: **3****11N501****B. Tech. I - Sem. (New Scheme) Main Exam., July – 2022****1FY1 – 01 Engineering Mathematics – I****Common to all Branches****Time: 2 Hours****Maximum Marks: 70****Min. Passing Marks:****Instructions to Candidates:**

*Part – A: Short answer questions (up to 25 words) 5 × 3 marks = 15 marks. Candidates have to answer 5 questions out of 10.*

*Part – B: Analytical/Problem Solving questions 3 × 5 marks = 15 marks. Candidates have to answer 3 questions out of 7.*

*Part – C: Descriptive/Analytical/Problem Solving questions 2 × 20 marks = 40 marks. Candidates have to answer 2 questions out of 5.*

*Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)*

1. NIL2. NIL**PART- A**

Q.1 What is the largest interval of  $x$  for which  $f(x) = xe^{x^2}$  is concave upward?

Q.2 Find the points of inflexion of the curve  $y = (x - 2)^2 (x - 3)^5$ .

Q.3 Find the radius of curvature at  $\left(\frac{3a}{2}, \frac{3a}{2}\right)$  on the Folium of Descartes

$$x^3 + y^3 = 3axy, a > 0.$$

Q.4 If  $u = \sec^{-1}\left(\frac{x^3+y^3}{x+y}\right)$ , Show that  $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = 2\cot u$ .

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- Q.5 Solve the partial differential equation  $p(1 + q) = 3q$ .
- Q.6 Solve the differential equation  $ydx - xdy + x^2 \cos x dx = 0$
- Q.7 If  $e^x$  is one of the linearly independent solution for the differential equation

$$x \frac{d^2y}{dx^2} - (2x - 1) \frac{dy}{dx} + (x - 1) y = 0,$$

Find the second linearly independent solution.

- Q.8 Write a short note on double points.
- Q.9 Find the values of  $p$  and  $q$  in the PDE  $z^2(p^2 + q^2) = x^2 + y^2$  in term of  $x, y, z$  and arbitrary constant.
- Q.10 Find the asymptotes of  $y^2(x - b) = x^3 + a^3$ ,  $a, b > 0$ .

### PART-B

- Q.1 Discuss the maxima and minima of the function  $f(x,y) = x^4 + y^4 - 2x^2 + 4xy - 2y^2$ .
- Q.2 Trace the Cartesian curve  $y^2(a + x) = x^2(a - x)$ ,  $a > 0$ .
- Q.3 Show that the asymptotes of the following curve cut the curve again in eight points which lie on a circle of radius unity:

$$(x^2 - 4y^2)(x^2 - 9y^2) + 5x^2y - 5xy^2 - 30y^2 + xy + 7y^2 - 1 = 0$$

- Q.4 Solve the differential equation -

$$\frac{d^2y}{dx^2} - \frac{1}{x} \frac{dy}{dx} + 4x^2y = x^4$$

- Q.5 The diameter and altitude of a right circular cylinder are measured as 4 cm and 6 cm respectively. If the possible error in each measurement is 0.1 cm, find approximately the maximum possible error in the value computed for the volume and lateral surface.
- Q.6 Solve the ODE  $y'' + 5y' + 4y = 0$  subject to the conditions  $y(0) = 0$  and  $y'(0) = 3$ .
- Q.7 Solve the PDE  $yp = 2yx + \log q$ .

## PART-C

Q.1 Find the dimension of the rectangular box, open at the top, of maximum capacity whose surface is 432sq. cm.

Q.2 Solve by the method of variation of parameter -

$$(x + 2) \frac{d^2y}{dx^2} - (2x + 5) \frac{dy}{dx} + 2y = (x + 1) e^x$$

Q.3 Find the equation of circle of curvature of the curve  $\sqrt{x} + \sqrt{y} = \sqrt{a}$  at  $\left(\frac{a}{4}, \frac{a}{4}\right)$ .

Q.4 Find a general solution of the PDE  $p^2 u^2 + q^2 = 1$  using Charpit's method.

Q.5 If  $z$  be a function of  $x$  and  $y$  and  $u = lx + my$ ,  $v = ly - mx$  be two other variables. Show

$$\text{that } \frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = (l^2 + m^2) \frac{\partial^2 z}{\partial u^2} + \frac{\partial^2 z}{\partial v^2}$$

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**11N503**

Roll No. \_\_\_\_\_

Total No of Pages: **2****11N503****B. Tech. I - Sem. (New Scheme) Main Exam., July – 2022  
1FY1 – 03 Engineering Chemistry  
Common to all Branches****Time: 2 Hours****Maximum Marks: 70****Min. Passing Marks:****Instructions to Candidates:**

*Part – A: Short answer questions (up to 25 words) 5×3 marks = 15 marks. Candidates have to answer 5 questions out of 10.*

*Part – B: Analytical/Problem Solving questions 3×5 marks = 15 marks. Candidates have to answer 3 questions out of 7.*

*Part – C: Descriptive/Analytical/Problem Solving questions 2×20 marks = 40 marks. Candidates have to answer 2 questions out of 5.*

*Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)*

1. NIL2. NIL**PART– A**

- Q.1 What is carbonate hardness?  
Q.2 Enlist methods for removal of carbonate and non-carbonate hardness of water.  
Q.3 Mention composition and properties of Flint glass and Pyrex glass.  
Q.4 Discuss role of gypsum in cement.  
Q.5 What are green solvents?  
Q.6 Enlist alternation sources of energy.

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- Q.7 Mention classification of coal with carbon content.
- Q.8 Define gross and net calorific value of coal.
- Q.9 Discuss briefly ultimate analysis of coal and its applications.
- Q.10 What is green energy?

### **PART-B**

- Q.1 What is boundary lubrication? What is its importance?
- Q.2 How is disinfection of water carried out? Mention various methods.
- Q.3 Draw flow diagram of steps involved in cement manufacture by Vertical Shaft Kiln technology. Write a few lines also.
- Q.4 Explain working of Redwood viscometer with the help of neat diagram.
- Q.5 Why is small amount of ethylene dibromide along with TEL used in IC engines?
- Q.6 Calculate weight and volume of air required for carbonization of 3 kg carbon.
- Q.7 Describe manufacture and uses of producer gas.

### **PART-C**

- Q.1 What is anodic protection? How does it work?
- Q.2 What is diversification of glass? What is importance of annealing in glass manufacture? What is importance of borosilicate glass in industry?
- Q.3 Write structure of graphite. Based on this, suggest why is this used as a solid lubricant?
- Q.4 Discuss concept of green chemistry in pollution prevention in industry. What is pollution prevention hierarchy?
- Q.5 Percentage composition of a sample of bituminous coal was found to be as follows –  
C=75.4%, H=5.3%, O=12.6%, N=3.2%, S=1.3% and remaining % of ash content.  
Calculate minimum weight of air necessary for complete combustion of 1.0 kg of coal and the % composition of dry products of combustion (by wt.).
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**11N509**

Roll No. \_\_\_\_\_

Total No of Pages: **3****11N509****B. Tech. I - Sem. (New Scheme) Main Exam., July – 2022**  
**1FY2 – 09 Elements of Mechanical Engineering (ME)**  
**Common to all Branches****Time: 2 Hours****Maximum Marks: 70****Min. Passing Marks:****Instructions to Candidates:**

*Part – A: Short answer questions (up to 25 words) 5 × 3 marks = 15 marks. Candidates have to answer 5 questions out of 10.*

*Part – B: Analytical/Problem Solving questions 3 × 5 marks = 15 marks. Candidates have to answer 3 questions out of 7.*

*Part – C: Descriptive/Analytical/Problem Solving questions 2 × 20 marks = 40 marks. Candidates have to answer 2 questions out of 5.*

*Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination. (Mentioned in form No. 205)*

1. NIL2. NIL**PART- A**

~~Q.1~~ Define internal energy and enthalpy.

~~Q.2~~ Differentiate steel and cast iron.

Q.3 Define the C.O.P. of a refrigeration system.

~~Q.4~~ Classify engineering materials.

~~Q.5~~ What is an air standard efficiency?

- ✓ Q.6 Why is a re-heater necessary in a gas turbine? What are its effects?
- Q.7 Differentiate forward and backward extrusion.
- Q.8 Define soldering.
- Q.9 When do we use worm gears?
- Q.10 State the law of belting.

### PART- B

- Q.1 A frictionless piston-cylinder device contains a gas initially at 0.8 MPa and  $0.015 \text{ m}^3$ . It expands quasi-statically at a constant temperature to a final volume of  $0.030 \text{ m}^3$ . The work output (in kJ) during this process will be.
- ✓ Q.2 Write the principle of the vapor compression refrigeration system.
- ✓ Q.3 What is the difference between Otto and Diesel cycle?
- Q.4 Define (a) Specific fuel consumption and (b) The calorific value of a fuel.
- Q.5 Mention the types of failures in gear drives?
- Q.6 Differentiate helical and spur gears.
- ✓ Q.7 Define slip and creep in case of belt drive.

### PART-C

- Q.1 A piston-cylinder assembly contains one kg air at 10 bar pressure and 500 K temperature. The piston moves outwards, and the air expands to 2 bar pressure and 350K temperature. Determine the maximum work obtainable. Assume the environmental conditions to be 1 bar and 290 K. Also, make calculations for the availability in the initial and final states.
- Q.2 A steam power plant uses steam as a working fluid and operates at a boiler pressure of 5 MPa, dry saturated, and a condenser pressure of 5 kPa. Determine the cycle efficiency for (i) Carnot cycle and (ii) Rankine cycle. Also, show the T-s representation for both the cycles.

- Q.3 In an Otto cycle, air at 1 bar and 290K is compressed isentropically until the pressure is 15 bar. The heat is added at constant volume until the pressure rises to 40 bar. Calculate the air standard efficiency and mean effective pressure for the cycle. Take  $C_v = 0.717 \text{ kJ/kg K}$  and  $R_{univ} = 8.314 \text{ kJ/kg K}$ .
- Q.4 Discuss the various welding processes in detail.
- Q.5 (a) Derive the velocity ratio of belt drive, (b) Derive the slip of belt drive
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**11N508**

Roll No. \_\_\_\_\_

Total No of Pages: **4****11N508****B. Tech. I - Sem. (New Scheme) Main Exam., July – 2022  
1FY2 – 08 Computer Fundamentals & Programming (CSE)  
Common to all Branches****Time: 2 Hours****Maximum Marks: 70  
Min. Passing Marks:****Instructions to Candidates:**

*Part – A: Short answer questions (up to 25 words) 5 × 3 marks = 15 marks. Candidates have to answer 5 questions out of 10.*

*Part – B: Analytical/Problem Solving questions 3 × 5 marks = 15 marks. Candidates have to answer 3 questions out of 7.*

*Part – C: Descriptive/Analytical/Problem Solving questions 2 × 20 marks = 40 marks. Candidates have to answer 2 questions out of 5.*

*Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)*

1. NIL2. NIL**PART– A**

- Q.1 What do you mean by the component of computers? Explain with a diagram.
- Q.2 What do you mean by input and output devices? Write down the name of any 4 input and 4 output devices.
- Q.3 What is the difference between System Software and Application Software? Write down the name of any 2 system software and 2 application software.

- Q.4 What do you mean by Cache memory, and why it is crucial in the memory system?
- Q.5 What is the difference between compiler and interpreter?
- Q.6 Draw a flowchart to find the minimum of 4 numbers.
- Q.7 Convert  $(242)_{10}$  into hexadecimal.
- Q.8 Subtract 11012 and 10102.
- Q.9 Write down all output/errors (if any with justification) of the following C programs-

```
#include<stdio.h>

#include<stdlib.h>

int main()

{

    int i = 0;

    for(i=0; i < 3; i++);

    {

        printf("loop");

        continue;

    }

    getchar();

    return 0;

}
```

Q.10 Explain the concept of Array in C.

## PART- B

Q.1 Convert the following numbers:

(i)  $(1056)_{16} = (?)_8 = (?)_2$

(ii)  $(5C6)_{16} = (?)_{10} = (?)_8$

(iii)  $(10111)_2 = (?)_{10} = (?)_8$

(iv)  $(74524)_8 = (?)_2 = (?)_{10}$

Q.2 Explain the concept of While Loop in C with an example.

Q.3 Write a C program to display the following patterns:

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

Q.4 What is a far pointer in C? How is it different from near pointer? Explain with an example.

Q.5 What do you mean by fundamental or primitive data types used in C, and how does it differs from derived data types used in C? Write down the most commonly used primitive and derived data types available in C.

Q.6 Write a program in C to find the sum of the series  $1!/1+2!/2+3!/3+4!/4+5!/5$  using the function.

Q.7 Write a program in C to convert decimal numbers to binary numbers using the function.



## **PART-C**

- Q.1 Write down a program in C to find the number of vowels and consonants in a text string.
- Q.2 Explain the concept of structures used in C. Write a C program to create students mark sheet (student's name, roll number and marks of 10 subjects) for 100 students. The program should be able to calculate the subject-wise and student-wise totals.
- Q.3 Explain the concept of the 1-D and 2-D array in C. Write a C program to perform a matrix multiplication operation.
- Q.4 Write a program in C using pointers to add two matrices and return the resultants matrix to the calling function.
- Q.5 Write a program in C to read data from the keyboard, write it to a file called INPUT, again read the same data from the INPUT file and display it on the screen.
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**11N504**

Roll No. \_\_\_\_\_

Total No of Pages: **3****11N504****B. Tech. I - Sem. (New Scheme) Main Exam., July – 2022  
1FY3 – 04 Communication Skills  
Common to all Branches****Time: 2 Hours****Maximum Marks: 70  
Min. Passing Marks:*****Instructions to Candidates:***

*Part – A: Short answer questions (up to 25 words) 5 × 3 marks = 15 marks. Candidates have to answer 5 questions out of 10.*

*Part – B: Analytical/Problem Solving questions 3 × 5 marks = 15 marks. Candidates have to answer 3 questions out of 7.*

*Part – C: Descriptive/Analytical/Problem Solving questions 2 × 20 marks = 40 marks. Candidates have to answer 2 questions out of 5.*

*Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)*

1. NIL2. NIL**PART – A**

- Q.1 Define non-verbal communication.
- Q.2 Describe the process of communication through a diagram.
- Q.3 Listening is very important in the process of communication. How?
- Q.4 Briefly describe four different types of reading skills.
- Q.5 What is the importance of good writing skills?
- Q.6 Describe ways through which writing skills can be improved.

Q.7 Define modal verbs.

Q.8 What is the difference between active and passive voice?

Q.9 Write the name of the poet and the play from which the poem "The Seven Stages of Man" has been taken.

Q.10 What announcement did the king make in the story "The Three Questions"?

### **PART- B**

Q.1 Why do you think improving communication skills is important for success in professional and personal fields?

Q.2 What steps should be taken to improve fluency in speaking?

Q.3 Describe different blocks which step the process of effective listening.

Q.4 Critically appreciate the following lines –

Not enjoyment and not sorrow,

Is our destined end or way;

But to act, that each tomorrow

Find us farther than to day.

Q.5 (a) Change the voice -

(i) He promised me a present.

(ii) You cannot pump the ocean dry.

(iii) I am watching you carefully.

(iv) Not a single word has been spoken by him in his defense.

(b) Complete the sentences below by using the correct tense of the verbs given.

(i) She thanked me for what I ..... (do).

(ii) She usually ..... (read) the newspaper after lunch.

(iii) The boys and girls ..... (decorate) the school for the minister's visit.

(iv) When we reached the hall, the speaker ..... already ..... finished.

Q.6 Write down the story, "The Necklace" in brief.

Q.7 Write a short paragraph on the lessons the pandemic COVID-19 has taught you.

### **PART-C**

Q.1 What are the various types of non-verbal communication? Discuss in detail.

Q.2 Explain 7C's of communication in detail.

Q.3 What steps can be taken to overcome common obstacles of reading?

Q.4 Write a letter to the chairman of your municipality about irregular water supply.

Q.5 How did the hermit answer the king's question through the incidents of previous day in the story, "The Three Questions"?

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11N507

Roll No. \_\_\_\_\_

Total No of Pages: 3

11N507

**B. Tech. I - Sem. (New Scheme) Main Exam., July – 2022**  
**1FY2 – 07 Basic Electrical Engineering**  
**Common to all Branches**

**Time: 2 Hours**

**Maximum Marks: 70**

**Min. Passing Marks:**

**Instructions to Candidates:**

*Part – A: Short answer questions (up to 25 words) 5 × 3 marks = 15 marks. Candidates have to answer 5 questions out of 10.*

*Part – B: Analytical/Problem Solving questions 3 × 5 marks = 15 marks. Candidates have to answer 3 questions out of 7.*

*Part – C: Descriptive/Analytical/Problem Solving questions 2 × 20 marks = 40 marks. Candidates have to answer 2 questions out of 5.*

*Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)*

1. NIL

2. NIL

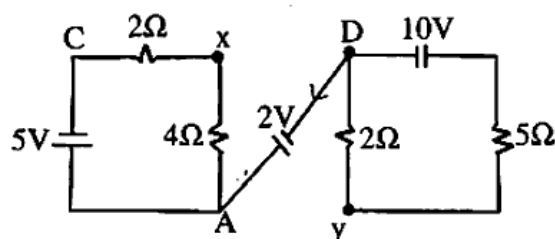
**PART- A**

- ✓ Q.1 What are Kirchhoff's laws?
- ✓ Q.2 Write down different types of energy sources.
- ✓ Q.3 What are the various values defined for a.c. quantity?
- Q.4 Write down the relationship for line current and phase current and line voltage and phase voltage for star connection of 3- $\phi$  system.

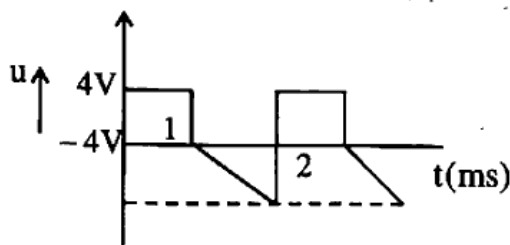
- Q.5 What are the different parts of DC machine?
- Q.6 What is an ideal transformer?
- Q.7 What are different types of transistors?
- Q.8 Write down the different types of rectifiers?
- Q.9 What is Silicon Controlled Rectifier (SCR)?
- Q.10 What is modulation in communication system?

### PART- B

Q.1 Find voltage  $V_{xy}$  in the given network -



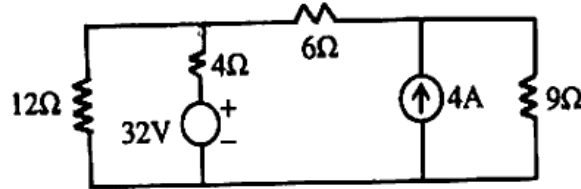
Q.2 Calculate the RMS and average value of the voltage wave shown in figure below.



- Q.3 How power can be measured using single wattmeter method? Derive the relation for power factor.
- Q.4 What is the construction and working principle of transformer?
- Q.5 Explain construction and working principle of DC Machines?
- Q.6 Write short note on SCR, TRIAC and UJT.
- Q.7 Discuss the amplitude modulation in detail. Derive the voltage equation of amplitude modulation.

## PART-C

- Q.1 (a) State and explain Thevenin's Theorem.  
(b) Compute the power dissipated in  $9\Omega$  resistor using superposition theorem.



- Q.2 A 3-phase motor operating on a 400 V balanced system develops 18.65 kW at an efficiency of 0.87 per unit and a power factor of 0.85. Calculate the line current and phase current if the windings are delta connected.
- Q.3 (a) An 8 pole DC machine has a wave winding containing 600 conductors. Calculate the generated emf when the flux per pole is 0.08 wb and speed is 215 rpm. If the flux per pole is made 0.05 wb. At what speed should the armature be drawn to generate 500V?  
(b) A 200 kVA, 3300/240V, 50Hz single phase transformer has 80 turns on the secondary winding. Assume an ideal transformer calculate:  
(i) Primary and secondary current on full load  
(ii) The maximum value of flux  
(iii) The no. of primary turns
- Q.4 Compare CB, CE and CC configuration of a transistor. For CE configuration prove that  $I_C = \beta I_B + (\beta + 1) I_{CO}$
- Q.5 Describe the different types of communications in details.
-