5TH SEM./ COMMON TO ALL/ 2023(W) NEW

Th-1 Entrepreneurship and Management & Smart Technology

Full Marks: 80 **Time- 3 Hrs**

Answer any Five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
   a. What is entrepreneurship?
   b. What is start up ?
   c. What is project appraisal?
   d. List the components of project cost.
   e. Define management.
   f. Write the need of inventory management.
   g. List two barriers in business communication.
   h. Write two methods of maintaining relations with subordinates.
   i. What is trademark? Write two advantages of having trade marks.
   j. What is smart technology?

2. Answer **Any Six** Questions 6 x 5

   a. Explain in brief the qualities of entrepreneur.
   b. What is Maslow theory of motivation. Explain.
   c. Explain SSI, Ancillary unit and Tiny units.
   d. Write a note on staffing as a function of management.
   e. Explain ABC Analysis (selective inventory control), a model of inventory managements.
   f. Write the components of IOT.
   g Explain different styles of leadership.
   h Write five points in payment of wages act.

3 Explain the assessment of demand and supply in potential area of growth. 10

4 Write the important functions of management. 10

5 Explain TQM concept-Quality Policy, Quality Management and quality system. 10

6 Explain the concept of 4Ps in marketing management. 10

7 Explain the application of IOT in smart healthcare and smart agriculture. 10

5TH SEM./ELECTRICAL/ 2023(W) NEW

Th-2 Energy Conversion-II

Full Marks: 80 **Time- 3 Hrs**

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
   a. What is hunting in synchronous Motor?
   b. State the condition necessary for paralleling alternator.
   c. What is the function of damper bar in synchronous motor?
   d. A 4 pole, 3 phase induction motor operates from a supply is 50 Hz, calculate the speed of the rotor in which slip is 0.04.
   e. Why centrifugal switch is used single phase induction motor?
   f. What is the V-curves in synchronous motor?
   g. Define step angle in stepper motor and state its value.
   h. Write down the advantages of stationary armature in alternator.
   i. What are the different modes of operation of an induction machine? In which operating mode, the developed torque opposes the rotation of rotor?
   j. In which rotor high starting torque is produced and why?

2. Answer **Any Six** Questions 6 x 5
   a. Describe the dark and bright lamp method with circuit diagram to perform parallel operation of two alternators.
   b. The power input to the rotor of 440V, 50 Hz, 6 pole, 3-phase, and induction motor is 80 KW. The rotor electromotive force is observed to make 100 complete alterations per minute. Calculate (i) the slip (ii) the rotor speed (iii) rotor copper losses per phase.
   c. Explain the principle of operation of synchronous motor with diagram. Why it will not run at other than synchronous speed?
   d. What is the effect of changing excitation on constant load of a synchronous motor?
   e. A 4-pole alternator has 18 slots/pole, single layer three phase winding. The 1st coil lies in slots 1 and 16. Calculate distribution factor and pitch factor.
   f. Explain the speed control of induction motor using Rotor resistance control.
   g Discuss in detail about Delta/Delta and Star/Star connection of 3 phase transformer.

3 A 3-phase, 4-pole, star-connected turbo-alternator has a smooth cylindrical type rotor. The effective resistance and synchronous reactance per phase are 0.15 Ω and 2.5 Ω. Calculate the voltage regulation when delivering 250 A at 6.6 kV and at 0.6 p.f. lagging. 10

4 Explain about the double field revolving theory in 1-phase induction motor. 10

5 Explain DOL starter with neat sketch. Obtain the expression for starting torque in terms of full load torque. 10

6 State and explain maintenance schedule of 3 phase Power transformer. 10

7 Write short notes on 10
   (a) Universal motor
   (b) Variable reluctance Stepper motor

5TH SEM. /ELECTRICAL/ 2023(W) NEW

Th- 3 Digital Electronics & Microprocessor

Full Marks: 80 **Time- 3 Hrs**

Answer any Five Questions including Q No.1& 2
Figures in the right-hand margin indicates marks.

1. Answer **All** questions 2 x 10

a. Perform the subtraction: 10100.01- 11011.10 using 2's complement method.

b. State De- Morgan's theorem.

c. Define Min-term and Max-term.

d. What is Modulus of a counter?

e. List the hardware interrupts of 8085 microprocessor in priority order.

f. Give two examples of each 2 byte and 3 byte instructions.

g. Define opcode and operand.

h. Convert (i) $(A0F6.1BE)_{16}$ to Decimal.

(ii) $(253.6)_8$ to Hexadecimal

i.What is the function of ALE and ALU in 8085 microprocessor.

j.Draw the AOI logic circuit of F= [(AB+C')D]'

2. Answer **Any Six** Questions 6 x 5

a. Simplify the given Boolean expression to minimum number of literals and draw the logic circuit of simplified expression.

F= [(ABC+A'B')'+BC]'

b. Design a binary to octal decoder with neat circuit diagram.

c. What is Bus? With neat diagram explain bus structure of 8085 microprocessor.

d. Draw the timing diagram for the MOV B, M instruction of 8085 microprocessor.

e. Simplify the expression by using K-map and realise using universal gates.

$F(P, Q, R, S) = \sum_m (3,5,6,7,8,11,12,13, 14, 15)$

f. Design a 2 bit magnitude comparator circuit by using logic gates.

g Explain different addressing modes of 8085 with example.

3 With proper pin diagram, discuss the function of each pin of 8085 microprocessor. 10

4 Explain different modes of operation of 8255 PPI. 10

5 Briefly explain the types of shift registers with suitable diagram. 10

6 Explain the working of an Asynchronous Decade Counter. 10

7 Write short notes on: 10

(i) Race around condition

(ii) Memory mapping

5TH SEM/ ELECTRICAL ./ 2023(W)NEW

Th- 4 Utilization of Electrical Energy and Traction

Full Marks: 80 **Time- 3 Hrs**

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
   a. Define solid angle.
   b. Why Alternating current is found most suitable for resistance welding?
   c. State Stephen's law of radiation.
   d. Define Electro-chemical equivalent of a substance.
   e. Define maintenance factor of illumination.
   f. What are the advantages of dielectric heating?
   g. Distinguish between Butt welding and Spot welding.
   h. Mention the advantages of electrification of track.
   i. What is a Group Electric Drive?
   j. What electrolytes must be used for refining the following metals.
   (i)Copper (ii) Iron

2. Answer **Any Six** Questions 6 x 5
   a. Explain the basic difference between electric arc welding and resistance arc welding.
   b. What are the factors on which the quality of electro-plating depends?
   c. Explain resistance heating and Classify it.
   d. Explain the laws of illumination.
   e. What are the advantages of electric traction over other systems?
   f. A 230 volt lamp has a total flux of 2000 lumens and takes a current of 0.4348 A. Calculate i) Lumens per watt (i.e. efficiency of the lamp) and ii) the MSCP per watt.
   g Discuss the characteristics of dc series motor.

Answer Any **Three** Questions.

3 (a) A current of 0.965A passing through Silver Nitrate solution for 10 minutes. Calculate the weight of silver deposited on the cathode. (Atomic wt. of silver =108 & valency factor=1) 5

(b) Explain various types of lightning scheme. 5

4 Discuss Regenerative braking and Magnetic braking. 10

5 Explain working of fluorescent tube with circuit diagram. What is the function of a choke and starter in fluorescent tube? 10

6 Discuss the Vertical core type inductance furnace and explain its working. 10

7 Write short notes on 10
   (a) Microwave heating.
   (b) Method of Choice of Electric Drives

5TH SEM./ ELE.& MECH./EEE /ELE./ EE(I&C)/ ETC& COMM./E&TC/ 2023(W) NEW

Th-5 Power Electronics & PLC

Full Marks: 80 **Time- 3 Hrs**

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
   a. Write down the firing i.e, triggering methods.
   b. What are the turn on methods of SCR?
   c. Define latching current of SCR.
   d. What is a free wheeling diode and why it is needed?
   e. Define chopper &write different chopper configuration.
   f. State the classification of inverters.
   g. What is SMPS and why it is preferred in comparison to linear regulator?
   h. State the advantages of PLC.
   i. Define commutation & why it is essential?
   j. Write down two factors affecting speed of the AC motors.

2. Answer **Any Six** Questions 6 x 5
   a. Show the two transistor model of SCR & explain its operation.
   b. Explain the static V-I characteristics of SCR.
   c. Explain the working of a step down chopper with a neat diagram.
   d. Explain the working of series inverter.
   e. What is the basic principle of cyclo-converter?
   f. Explain briefly the operation of chopper in all four quadrants.
   g What is PLC? Write down applications of PLC.

Answer Any **Three** Questions

3 Explain the operation of UJT & also justify how it can be used as a relaxation oscillator. 10

4 Explain the working of a half wave converter with R-L load, with and without freewheeling diode. Show the o/p wave forms under the above case. 10

5 Explain the principle of working of UPS with a neat block diagram & state its application. 10

6 Draw the dynamic characteristics of an SCR and explain in detail. 10

7 Design a two way traffic light signalling system with the following requirements. 10

1. There should be a START & STOP push button to start the signalling process.

2. Once ON, side-1 lights should follow the patterns below;

Side-1 : Green light should be ON for 30 seconds.

Then Side-1 : Amber light should be ON for 3 seconds.

Then Side-1 : Red light should be ON for 30 seconds and the process repeats.

At the same time Side-2 lights would ON following stages:

Side-2 : Red light should be on for 33 seconds.

Then Side-2: Green light should be ON for 27 seconds.

Then Side-2 : Amber light should be ON for 3 seconds and the process repeats.