

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. Name two barriers in entrepreneurship. 2
 - b. Write two advantages of preliminary project report. 2
 - c. Write two techniques /models of inventory management. 2
 - d. How does branding helps manufacturers, retailer and consumers? 2
 - e. Name two symptoms of bad management. 2
 - f. Write two primary responsibilities of Human Resource Department in an industry. 2
 - g. Write two functions of a leader. 2
 - h. Name four personal protective equipment used in industry. 2
 - i. Write two applications of break-even analysis. 2
 - j. Write two applications of smart agriculture. 2
2. Answer **Any Six** Questions 6 x 5
 - a. Compare between an entrepreneur and manager 5
 - b. Write a short note on a successful Indian Entrepreneur. Mention any five quality in him/her. 5
 - c. Explain the role of District Industry Center in promoting enterprises. List any five supports provided by DIC to entrepreneur. 5
 - d. What are the parameters used to decide the plant capacity in a project? 5
 - e. What is TQM? Explain the need of TQM in small enterprises. 5
 - f. Write any five safety provisions in Factory Act,1948? 5
 - g. Explain the techniques of motivation. 5
3. a. What is Technology Business Incubator? Explain with example. 10
b. Explain the success story of an Indian start up.
4. Explain the components of Techno economic feasibility report. 10
5. Explain delivery schedule, market need and inventory control in production planning and control. 10
6. Write the Concept of IoT and how does it work. 10
7. Explain the management of working capital 10

5TH SEM./ ELECTRICAL/2022(W)

Th2 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. Define distribution factor.
 - b. What are the effects of armature reaction?
 - c. Define hunting in a synchronous motor.
 - d. Write two applications of synchronous motor.
 - e. Define slip and slip speed.
 - f. Write down the condition of maximum torque in 3-phase induction motor.
 - g. What are the methods to change the direction of rotation of capacitor start, capacitor run motor?
 - h. What are the types of stepper motor?
 - i. Write down two applications of series motor.
 - j. Write down two advantages of grouping of winding in 3-phase transformer.
2. 6 x 5
 - a. Derive the expression of distribution factor of an alternator.
 - b. Write a short note on V-curve of synchronous motor.
 - c. What are the losses of an induction motor? Draw the power flow diagram of an IM.
 - d. Draw and explain torque-slip characteristic of 3-phase induction motor.
 - e. Explain the construction and working principle of universal motor.
 - f. Briefly explain about the working principle of hybrid stepper motor.
 - g. What are the conditions of parallel operation of 3-phase transformer?
3. a. A 500 volt, 50 kVA alternator having effective resistance of 0.2Ω , if an excitation current of 10 A produces 200 A armature current on short circuit and an emf of 450 volts on open circuit then calculate the value of synchronous reactance. 05
- b. A 4-pole, star connected alternator is rated at 15 kVA, 415 volt. The synchronous reactance is $5\Omega/\text{phase}$. The dc voltage of 25 volt applied across the terminal causes a current of 25 A. Calculate the voltage regulation for a load of 10 kVA at 0.8 p.f lag. 05
4. A slip ring IM develops a maximum torque of 4 times the full load torque at a slip of 0.2. The per phase rotor resistance is 0.04Ω . The stator resistance and rotational losses are negligible. Calculate (i) the slip at full load torque.(ii) the external resistance to be added to obtain maximum torque at starting. 10
5. Explain double revolving field theory to produce starting torque of 1-phase induction motor. 10
6. Explain the construction, working principle and torque-speed characteristic of a shaded pole motor. 10
7. Explain the construction, working principle & running characteristic of single phase series motor. 10

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. Construct the truth table of NAND and XOR gate.
 - b. Convert the following hexadecimal numbers to binary.
 - (i) F297 (ii) E79A.6A4
 - c. Simplify the expression $F = BD + B\bar{C}\bar{D} + A\bar{B}\bar{C}\bar{D}$
 - d. Why is a multiplexer called a data selector?
 - e. What do you mean by toggling?
 - f. Write down the transition table for D-flipflop.
 - g. Write down the function of following signal of 8085.
 - (i) HOLD (ii) S_0 & S_1
 - h. How many machine cycles are required by the following instructions of 8085?
 - (i) IN 08H;
 - (ii) LXI H, 2450H;
 - (iii) MVI B, 15H;
 - (iv) MOV C, M;
 - i. Give 2 example of instructions for data transfer group and logical group.
 - j. What are different operating modes of 8255?
2. Answer **Any Six** Questions 6 x 5
 - a. Obtain the real minimal expression for $f = \sum m(0, 2, 4, 6, 7, 8, 10, 12, 13, 15)$ and implement it using universal gates.
 - b. Given $\bar{A}\bar{B} + \bar{A}B = C$, find $\bar{A}\bar{C} + \bar{A}C$.
 - c. Discuss half adder circuit, truth table and implement by using NOR gate.
 - d. Design 4-bit asynchronous counter with logic diagram, timing diagram and truth table.
 - e. What are various status flags provided in 8085 microprocessor and discuss their role.
 - f. Draw the timing diagram for the instruction MVI C, 12H.
 - g. Write an assembly language program to add two 8-bit numbers, the sum may be of 16 bits.
3. With a neat block diagram explain the architecture of 8085 microprocessor and explain function of each block. 10
4. Explain different addressing modes of 8085 microprocessor with examples. 10
5. Draw the block diagram of PPI 8255 and describe each block. 10
6. With neat diagram explain the working of serial-in serial-out and parallel-in serial-out shift registers with truth table. 10
7. Draw the circuit diagram of edge triggered JK flip-flop and explain its operation with the help of a truth table. How is the race around condition eliminated? 10

5TH SEM./ELECTRICAL /2022(W)

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. State Faraday's First Law of Electrolysis.
 - b. Define(i) Energy efficiency (ii)MHSCP
 - c. Write any two advantages of Vertical core type Induction furnace.
 - d. State the groups of systems of electric Traction.
 - e. Why primary winding coils are made hollow in coreless induction furnace?
 - f. What do you mean by invert squares law in illumination?
 - g. Write any two applications of electrolysis.
 - h. State Stephen's law in electrical heating and the mode of heat transfer associated with it.
 - i. What are the applications of DC motors?
 - j. What is resistance welding? Give an example.
2. Answer **Any Six** Questions 6 x 5
 - a. Describe about the polar curves in illumination in details.
 - b. Write a short note on metal arc welding using a neat circuit diagram.
 - c. Explain the extraction of zinc from zinc oxide in electrolyte process briefly.
 - d. Explain about the magnetic braking in electric traction briefly.
 - e. Describe the operating principle of dielectric heating with its applications.
 - f. Describe about the working principle of gas-filled lamp with a neat diagram.
 - g. Differentiate between DC and AC arc welding.
3. Explain the factors on which the design of simple lighting schemes depends. 10
4. Explain the three modes of Heat Transfer in substances briefly. 10
5. Explain the speed control of DC Traction motors by Metadyne control method briefly. 10
6. Describe the factors affecting the electro-deposition in electrolytic cell in details. 10
7. Write a short note on i)Projection welding ii) Single phase AC system of track electrification. 10

5TH SEM./ ELE & MECH/ ELE AND ETC/ ELECTRICAL/ EE(INST & CONT) / ETC & COMM./ ETC & TELECOMM / 2022(W)

Th-5 Power Electronics and PLC

Full Marks: 80

Time- 3 Hours

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 pinch off voltage of MOSFET.
 - b. Why power factor of semi converter is better than full converter?
 - c. What is meant by commutation of SCR and list its types.
 - d. What is meant by phase control?
 - e. What is constant frequency control of chopper?
 - f. What is the function of feedback diodes in bridge inverter?
 - g. What is cycloconverter? List its types.
 - h. Name any two applications of SMPS.
 - i. Draw a neat sketch of battery charger.
 - j. List any four logical and arithmetic instructions in PLC.

2. Answer **Any Six** Questions 6 x 5
 - a. Discuss why TRIAC is rarely operated in I quadrant with -ve gate current and in III quadrant with +ve gate current.
 - b. Discuss the operation of single-phase half wave-controlled converter with RL load with neat diagram.
 - c. Explain the operation of step up chopper and derive an expression for its output voltage.
 - d. Explain gate triggering of thyristor by R-C firing.
 - e. Explain single phase full wave AC regulator.
 - f. Develop ladder diagram of DOL & STAR-DELTA starter.
 - g. Explain CTD & CTU instruction of PLC.

3. Describe the UJT triggering circuit with neat sketch. 10
4. Explain the working of Semi Converter. Draw and find out the expression for the output voltage. 10
5. Write a short note on the following: 10
 - (a) Step-up cyclo-converter
 - (b) Series Inverter
6. Explain speed control for DC shunt motor using converter and chopper. 10
7. Explain switching characteristics of SCR with necessary diagram. 10