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15EE51

**Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019**

**Management and Entrepreneurship**

Time: 3 hrs.

Max. Marks: 80

**Note: Answer FIVE full questions, choosing ONE full question from each module.**

**Module-1**

- 1 a. Briefly explain the functional area's of management. (06 Marks)  
 b. Bring out the difference between management and administration. (05 Marks)  
 c. Discuss the importance of planning. (05 Marks)

**OR**

- 2 a. Explain the various roles a manager plays. (05 Marks)  
 b. Explain the different types of plans. (06 Marks)  
 c. Briefly explain the steps in decision making. (05 Marks)

**Module-2**

- 3 a. What are the various principles of organization? (05 Marks)  
 b. What is committees and explain the different types of committees? (05 Marks)  
 c. Explain with a diagram Maslow's theory of motivation. (06 Marks)

**OR**

- 4 a. Distinguish between centralization and decentralization. (05 Marks)  
 b. Define staffing. Explain importance and functions of staffing. (06 Marks)  
 c. Explain the meaning and importance of coordination. (05 Marks)

**Module-3**

- 5 a. Explain social responsibilities of business towards different groups. (05 Marks)  
 b. Explain the different stages of an Entrepreneurial process. (06 Marks)  
 c. Explain the role of an entrepreneurs in economic development in INDIA. (05 Marks)

**OR**

- 6 a. What are the qualities of an Entrepreneur? (05 Marks)  
 b. What are the functions of an entrepreneurs? (05 Marks)  
 c. Write a note on social audit and business ethics. (06 Marks)

**Module-4**

- 7 a. Explain the different policies for development of SSI in INDIA. (06 Marks)  
 b. Explain the impact of Liberalization, Privatization and Globalization on SSI's. (05 Marks)  
 c. Write a note on TECSOK (Technical Consultancy Services Organization of Karnataka). (05 Marks)

**OR**

- 8 a. What are the different roles of SSI's? (05 Marks)  
 b. Explain the Impact of GATT and WTO. (05 Marks)  
 c. Write a note on (i) KIADB (ii) KSFC (06 Marks)

**Module-5**

- 9 a. Explain the factors to be considered for selection of projects. (05 Marks)  
 b. List the various contents of the project report. (06 Marks)  
 c. Explain PERT and CPM. (05 Marks)

**OR**

- 10 a. Explain the process of project appraisal. (06 Marks)  
 b. Explain the need and significance of project report. (05 Marks)  
 c. What are the guidelines by planning commission for a project report? Explain. (05 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and / or equations written eg. 42+8 = 50, will be treated as malpractice.

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15EE52

## Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Microcontroller

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Draw the programming model of 8051  $\mu$ c. Explain the function of following :  
(i) Accumulator, Register B and CPU Registers. (10 Marks)  
(ii) Program controller, Stack and Stack pointer  
b. After adding the following data, show the states of CY, AC and P flags:  
(i) 55h and AAh (06 Marks)  
(ii) 12h and 62h

### OR

- 2 a. Explain the internal RAM organization of 8051 with suitable diagrams. (08 Marks)  
b. How many address lines are required for accessing the data in the following memory ICs, while data is organized as bytes:  
(i) 512 bytes RAM (ii) 8K RAM. (04 Marks)  
c. Explain the program ROM space allocation for the following :  
(i) EA = 0 for 8751 chip (ii) EA =  $V_{CC}$  with both on-chip and off-chip ROM for 8751. (04 Marks)

### Module-2

- 3 a. Explain the following assembler directives:  
(i) DB (ii) ORG (iii) EQU (06 Marks)  
b. Explain the working of the instruction SUBB when borrow = 0 and borrow = 1. (06 Marks)  
c. A student has to take 6 courses in a semester. The marks of the student out of 25 are stored in RAM locations 50h onwards. Write a program to find the average marks and save it in Register R6. (04 Marks)

### OR

- 4 a. Write a program to complement the value AAh, 800 times. (04 Marks)  
b. With respect to Port 0, explain the following :  
(i) Working of Port 0  
(ii) Dual role of Port 0  
(iii) Example program to use Port 0 as input and output. (08 Marks)  
c. Write a program to generate a square wave of 50% duty cycle on bit 5 of Port-2. (04 Marks)

### Module-3

- 5 a. Write an 8051 'C' program to send values - 4 to +4 to Port P1. (05 Marks)  
b. Write 8051 'C' program to toggle all the bits of P0 and P2 continuously with 250 ms delay. (05 Marks)  
c. Write an 8051 'C' program to convert packed BCD 0x28 to ASCII and display bytes on P1 and P2. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
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OR

- 6 a. Explain Mode-1 programming of 8051 timer. Describe the different steps to program in Mode-1. (08 Marks)
- b. Write 8051 assembly program to generate square wave with  $t_{ON} = 3\text{ms}$  and  $t_{OFF} = 10\text{ms}$  on all pins of Port 0. System clock is 22 MHz. Use timer 0 in Mode-1. (08 Marks)

Module-4

- 7 a. Describe bit status of SCON register. (08 Marks)
- b. Write 8051 assembly program to receive the data in serial form and send it out to Port-0 in parallel form. Save the data in RAM location 62h. Assume baud rate = 9600. Use timer 1 in Mode 2. (05 Marks)
- c. Calculate the baud rate if TH1 = -2, SMOD = 1, XTAL = 11.0592 MHz. Is this baud rate supported by IBM PCS? (03 Marks)

OR

- 8 a. Explain the steps in executing an interrupt. (04 Marks)
- b. Write 8051 assembly program in which 8051 reads data from P1 and writes it to P2 continuously while giving a copy of it to serial COM port to be transferred serially. Assume baud rate = 9600 and XTAL = 11.0592 MHz. Use timer -1 in mode 2. (08 Marks)
- c. Explain the bit status of IP Register. (04 Marks)

Module-5

- 9 a. Calculate the address range of 16x2 LCD and 20x1 LCD. (03 Marks)
- b. Explain the internal architecture of ADC 0804 and its timing diagram to convert analog data to digital form. (10 Marks)
- c. Consider 8 bit ADC. Assume  $V_R = 5\text{V}$ . Calculate the 8 bit digital output when  $V_{in} = 3\text{V}$ . (03 Marks)

OR

- 10 a. Write 8051 assembly program to rotate a stepper motor  $64^\circ$  in clockwise direction. The motor has step angle of  $2^\circ$ . Use 4 step sequence and draw the schematic diagram. Steps per revolution = 180, number of rotor teeth = 45. Movement per 4 step sequence =  $8^\circ$ . (08 Marks)
- b. What is PWM technique? Explain bidirectional motor control using L293 chip. If SW = 0, the dc motor moves clockwise and if SW = 1, the dc motor moves counter-clockwise. Draw the schematic diagram. Write 8051 assembly program to do this. (08 Marks)

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15EE53

## Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Power Electronics

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- Explain any five types of power electronics converter system and also specify the form of input and output waveforms. (10 Marks)
  - With block diagram, explain the peripheral effects and remedies of power electronic converter systems. (06 Marks)

OR

- With circuit diagram and waveforms explain uncontrolled single phase full wave rectifier with RL load. (08 Marks)
  - With circuit diagram and waveforms explain diode switched RL load with necessary equations. (08 Marks)

### Module-2

- Explain the different types of base drive control circuits for BJT. (08 Marks)
  - In the bipolar transistor circuit shown in Fig.Q.3(b)  $\beta$  varies between 5 and 50. The load resistance  $R_C = 10\Omega$ ,  $V_{CC} = 180V$  and  $V_{BB} = 10V$ . If  $V_{CE(sat)} = 1.0V$  and  $V_{BE(sat)} = 1.4V$ . Calculate:
    - The value of  $R_B$  that results in saturation with an overdrive factor of 6.
    - The forced  $\beta_f$
    - The total power loss in the transistor. (08 Marks)

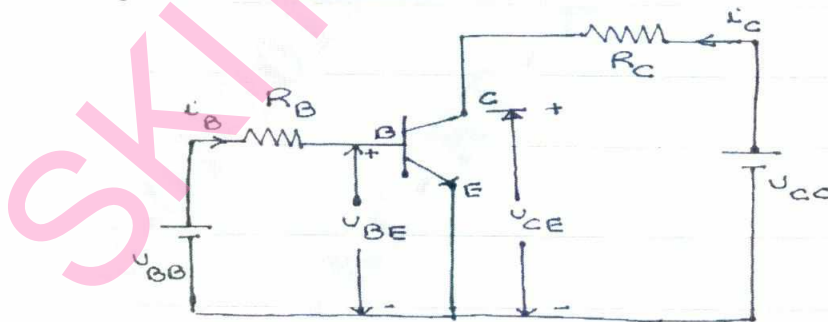


Fig.Q.3(b)

OR

- Sketch the structure of n-channel enhancement type MOSFET and explain its working principle. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
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- b. The IGBT shown in the circuit of Fig.Q.4(b) has the following data:  $t_{on} = 3\mu\text{sec}$ ,  $t_{off} = 1.2\mu\text{sec}$ , duty cycle  $D = 0.7$ ,  $V_{ce(sat)} = 2\text{V}$ ,  $f_s = 1\text{kHz}$ . Calculate:
- Average load current.
  - Conduction power loss.
  - Switching power loss during turn-on and turn off.

(08 Marks)

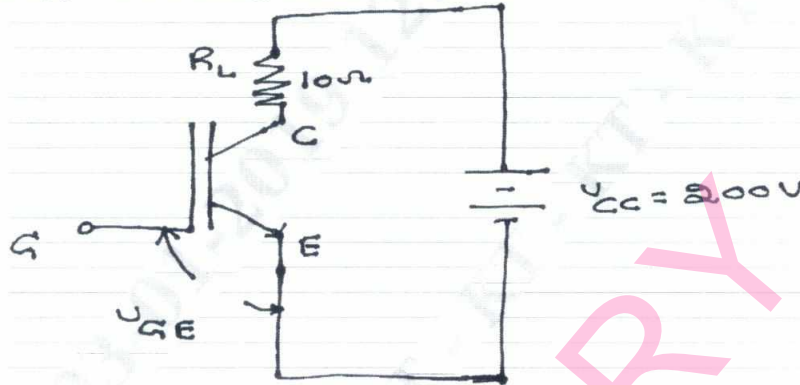


Fig.Q.4(b)

**Module-3**

- 5 a. Derive an expression for the anode current of thyristor with the help of transistor analogy. (10 Marks)
- b. For the circuit shown in Fig.Q.5(b) if the latching current is 4mA, calculate the minimum width of gate pulse required to properly turn on the SCR. (06 Marks)

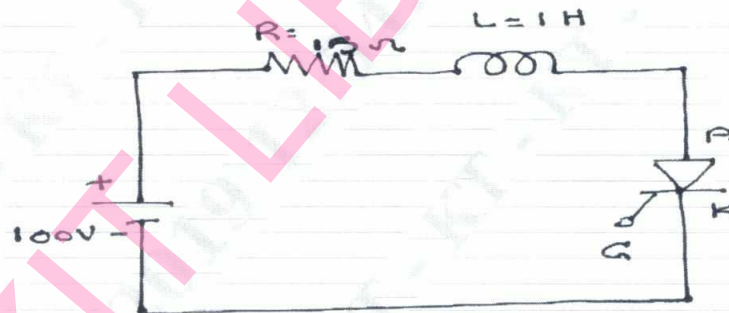


Fig.Q.5(b)

OR

- 6 a. With circuit diagrams and wave forms explain the method of protection of SCR. (10 Marks)
- b. How many SCRS are required in a series string to withstand a d.c. voltage of 5000V in steady state, if the SCRS have steady state voltage rating of 1200V and the steady state derating factor is 10%. Assuming maximum difference in leakage current of SCRS to be 12mA, calculate the value of voltage sharing resistance to be used. (06 Marks)

**Module-4**

- 7 a. With circuit diagram and waveforms explain dual converters. (08 Marks)
- b. With circuit diagram and waveforms explain the operation of three phase full converters. (08 Marks)

OR

- 8 a. With circuit diagram and wave forms explain the operation of full wave ac voltage controller connected to resistive load. And also obtain the equation for RMS output voltage. (08 Marks)
- b. A single phase half wave ac voltage controller has an input voltage of 200V and a load resistance of  $10\Omega$ . The firing angle of each thyristor is 30 degree in each positive half cycle. Calculate:
- Average output voltage
  - RMS output voltage
  - Power output
  - Power input.
- (08 Marks)

**Module-5**

- 9 a. With circuit diagram and waveforms explain the working of class D chopper. (08 Marks)
- b. A step up chopper has input voltage of 200V and output voltage of 660V. If the nonconducting time of thyristor is  $100\mu\text{sec}$ . Calculate the pulse width of the output voltage. If the pulse width is halved for constant frequency operation, calculate the new output voltage. (08 Marks)

OR

- 10 a. With circuit diagram explain the operation of a single phase full bridge inverter supplying a resistive load. (08 Marks)
- b. Explain any two modulation techniques available for voltage control of a single phase inverter. (08 Marks)

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15EE54

## Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Signals and Systems

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

### Module-1

- 1 a. Distinguish between
- Continuous and Discrete time signals
  - Even and Odd signals
  - Periodic and Non-periodic signals
  - Deterministic and Random signals
  - Energy and Power signals.
- b. Determine and sketch the even and odd parts of the signal shown in Fig Q1(b) (10 Marks)

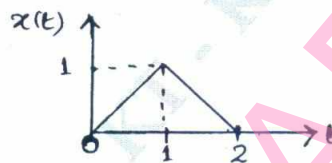


Fig Q1(b)

(06 Marks)

OR

- 2 a. Determine whether the following signals are periodic, if periodic determine the fundamental period
- $x(t) = \cos 2t + \sin 3t$
  - $x[n] = \cos\left(\frac{n\pi}{5}\right) \sin\left(\frac{n\pi}{3}\right)$
- b. Using convolution integral, determine and sketch output of LTI system whose input and impulse response is  $x(t) = e^{-3t} [u(t) - u(t-2)]$  and  $h(t) = e^{-t} u(t)$  (08 Marks)

### Module-2

- 3 a. Determine the convolution sum of two sequences
- $$x[n] = \left\{ \underset{\uparrow}{3}, 2, 1, 2 \right\} \text{ and } h[n] = \left\{ \underset{\uparrow}{1}, 2, 1, 2 \right\}.$$
- b. Find the step response of an LTI system, if impulse responses are
- $h(t) = t^2 u(t)$
  - $h[n] = \left(\frac{1}{2}\right)^n u[n]$

OR

- 4 a. Find the output response of the system described by a differential equation
- $$\frac{d^2 y(t)}{dt^2} + 6 \frac{dy(t)}{dt} + 8y(t) = \frac{dx(t)}{dt} + 2x(t).$$
- The input signal  $x(t) = e^{-t} u(t)$  and initial conditions are  $y(0) = 2, \frac{dy(0)}{dt} = 3.$  (06 Marks)
- b. Draw the direct form I and direct form II implementation of the following differential equation.
- $$\frac{d^2 y(t)}{dt^2} + 3 \frac{dy(t)}{dt} + 2y(t) = \frac{d^2 x(t)}{dt^2} + \frac{dx(t)}{dt}$$
- (06 Marks)
- c. Check whether the response of LTI system  $y[n] = 2x[n+1] + 3x[n] + x[n-1]$  is causal and stable? (04 Marks)

**Module-3**

- 5 a. State and prove the following properties in continuous time Fourier transform i) Linearity (10 Marks)  
 ii) Time shift iii) Time differentiation. (10 Marks)  
 b. Find the Fourier Transformation of  $x(t) = e^{-at} u(t)$ ,  $a > 0$ . (06 Marks)

**OR**

- 6 a. Using partial fraction expansion and linearity to determine the inverse Fourier transform of  

$$x(j\omega) = \frac{-j\omega}{(j\omega)^2 + 3j\omega + 2}$$
 (08 Marks)  
 b. Find the frequency response and impulse response of the system described by the differential equation.  

$$\frac{d^2y(t)}{dt^2} + 3\frac{dy(t)}{dt} + 2y(t) = 2\frac{dx(t)}{dt} + x(t)$$
 (08 Marks)

**Module-4**

- 7 a. State and prove the following properties in Discrete time Fourier transform  
 i) Frequency shift ii) Parseval's theorem. (10 Marks)  
 b. Find DTFT of the following signal  
 i)  $x[n] = \left(\frac{1}{2}\right)^{n+2} u[n]$  ii)  $x[n] = 2(3)^n u[-n]$  (06 Marks)

**OR**

- 8 a. Using DTFT, find the total solution to the difference equation for discrete time  $n \geq 0$ .  
 $5y(n+2) - 6y(n+1) + y(n) = (0.8)^n u(n)$  (08 Marks)  
 b. Determine the difference equation description for the system with the following impulse response  
 $h[n] = \delta[n] + 2\left(\frac{1}{2}\right)^n u(n) + \left(\frac{-1}{2}\right)^n u(n)$  (08 Marks)

**Module-5**

- 9 a. What is region of convergence? List any 5 properties of ROC. (07 Marks)  
 b. Find the z-transform and ROC of the signal  $x[n] = -b^n u[-n-1]$  (05 Marks)  
 c. State and prove time shift property. (04 Marks)

**OR**

- 10 a. Determine the inverse z-transform of  $x(z)$   

$$x(z) = \frac{1}{1 - 1.5z^{-1} + 0.5z^{-2}}$$
 for ROC  $|z| > 1$ ;  $\frac{1}{2} < |z| < 1$ . (06 Marks)  
 b. Consider a causal discrete time sequence whose output  $y(n)$  and  $x(n)$  are related by  

$$y(n) - \frac{5}{6}y(n-1) + \frac{1}{6}y(n-2) = x(n)$$
  
 i) Find its system function ii) Find its impulse response  $h[n]$ . (10 Marks)

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15EE553

## Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Electrical Estimation and Costing

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. Define estimating and explain the purpose of estimating and costing. (05 Marks)  
b. Explain the following : i) payment of bills ii) contingencies iii) purchase order. (06 Marks)  
c. State the purpose of IE rule and regulations. Explain IE rules 29, 30 and 55. (05 Marks)

OR

- 2 a. Explain purchase system. (09 Marks)  
b. What is a tender form? Explain various modes of tendering. (07 Marks)

### Module-2

- 3 a. Explain the different systems of distribution of energy in a building. (05 Marks)  
b. Explain the points on which the choice of wiring system can be made. (05 Marks)  
c. Determine the size of the copper conductor for a 2-core cable required to carry a maximum current of 60A. Length of the cable used is 100 meters and declared supply voltage is 240V ac. [current ratings of cables shown in Table.Q3(c) may be referred]. (06 Marks)

Size of cable		Current rating in Amps		Approximate Ampere –meter per volt drop
No. and die of wire	Area in mm <sup>2</sup>	2 core cable	3 or 4 core cable	
19/1.12	19.35	62	50	1050
19/1.32	25.80	74	59	1475
19/1.626	38.70	97	78	2200

Table Q3(c)

OR

- 4 a. With reference to internal electrification of building, explain how to determine the following:  
i) total load ii) rating of main switch and distribution board iii) number of circuits. (06 Marks)  
b. Explain the three essential points which must be considered while determining the size of the conductor for internal wiring for a given circuit. (06 Marks)  
c. A residential building is to be provided with electrical installation to be connected to a single phase, 240V, 50Hz AC supply. Details of the electrical points to be installed in the building are as follows :  
Lighting circuit : light points – 8 nos. 5A socket outlets – 7nos.  
Heating circuit : 15A socket outlets – 2 nos. (1 for kit, 1 for both room).  
Determine : i) total number of sub-circuits ii) rating of distribution board iii) size of cable for lighting circuit iv) size of cable for heating circuit. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. What do you understand by 'Service Line'? What are the types of service connections that are in use? Compare the different types of service connections. (05 Marks)
- b. Prepare an estimation of materials for providing OH service connection to a single storied building with 240V, 1 $\phi$ , 50Hz AC supply. The building has a light and Fan load of 5 KW. The supply is to be given from an overhead line 20m away from the building. [Assume missing data]. (06 Marks)
- c. State the important considerations regarding motor installation wiring. (05 Marks)

**OR**

- 6 a. With simple sketches, explain any two methods of installation of overhead service lines based on the prevailing conditions of the building. (04 Marks)
- b. Explain how to determine the following for the purpose of wiring : i) input power to a motor ii) input current to motors iii) size of the cable iv) rating of the fuse. (08 Marks)
- c. A 10 HP(metric), 415V, 3 – phase, 50 Hz induction motor is to be installed at the middle of a 30m  $\times$  10m workshop. The motor has been supplied along with STAR/DELTA starter. The meter – board shall be located at one corner of the workshop. Draw :  
i) The plan of the workshop showing positions of the equipments  
ii) The layout of the wiring. The wiring is to be of surface conduit type. (04 Marks)

Module-4

- 7 a. Explain the functions of the following in relevance to OH transmission and distribution.  
i) phase plates ii) beads of jumpers. (04 Marks)
- b. Explain the necessity of 'Earthing of Transmission Line Supports' and also show with a neat sketch how earthing of a 'Line Support' is done using pipe earthing. (08 Marks)
- c. A 1 km long overhead distribution line of 415V, 3 phase, 50 Hz is to be erected along a straight route from a 100KVA, 11/0.433 – 0.240 KV pole mounted sub-station. The line is to be laid with 6/1  $\times$  3.00mm ACSR conductor on RCC poles of 9m length. The span between adjacent poles is to be maintained at 50m. Draw a rough sketch of the route and find : i) the number of poles required ii) the total length of the ACSR conductor required iii) the length of the 8 SWG GI wire for earthing. (04 Marks)

**OR**

- 8 a. Explain what is meant by 'repairing and jointing of overhead ACSR transmission conductors'. How repairing or jointing is done? (04 Marks)
- b. List out the various points to be considered at the time of erection of overhead lines. (08 Marks)
- c. An overhead distribution line of 415V, 3 phase, 50Hz is to be erected along a straight route. The length of the line is 300 meters and the end supports are terminal structures. The span between adjacent Poles is 50 meters. Consider 4 SWG bare copper wires for phase, neutral and street light control; 8 SWG galvanized steel wire for earth wire. Find the :  
i) number of intermediate poles and the number of terminal structures ii) length of wire of each size for the line. (04 Marks)

Module-5

- 9 a. Explain the requirement of the following in a substation :  
i) substation auxiliaries supply ii) substation earthing. (08 Marks)
- b. Draw the single line diagram for a 10MVA, 33/11KV substation and prepare an estimation of materials required, with their complete specification. (08 Marks)

**OR**

- 10 a. Explain the functions of the following in a substation :  
i) lighting arresters ii) isolators iii) earthing switch iv) batteries. (08 Marks)
- b. Draw the single line diagram for 132/33KV substation with main and transfer bus having 2  $\times$  40 MVA transformers. Prepare on estimation of materials required, with their complete specification. (08 Marks)

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15EE563

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019

## Renewable Energy Sources

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. Discuss four causes of energy scarcity. (04 Marks)  
b. Find the solar elevation angle ( $\alpha$ ) at 2h after local solar noon on 1<sup>st</sup> June 2012 for a city, which is located at  $26.75^{\circ}$ N latitude. (06 Marks)  
c. With the help of diagram, define : (06 Marks)  
i) Solar altitude angle ii) Latitude angle iii) Surface Azimuth angle.

OR

- 2 a. Define i) Declination angle and ii) Hour Angle. (04 Marks)  
b. Write note on classification of energy resources. (06 Marks)  
c. Briefly explain any six solar thermal energy applications. (06 Marks)

### Module-2

- 3 a. With neat sketch, discuss important parts of flat plate solar collector. (04 Marks)  
b. With the help of diagram, explain Brayton cycle solar electric generation. (06 Marks)  
c. With neat diagram, explain solar pond and write any one advantage of it. (06 Marks)

OR

- 4 a. What are the factors which limit the efficiency of the solar cell? (04 Marks)  
b. Briefly explain any six applications of solar cells. (06 Marks)  
c. With the help of neat diagram, explain key elements of a Photo – Voltaic cell. (06 Marks)

### Module-3

- 5 a. Discuss any four applications of hydrogen energy. (04 Marks)  
b. Explain the thermochemical hydrogen production technology. (06 Marks)  
c. Describe the main considerations in selecting site for wind generators. (06 Marks)

OR

- 6 a. Define and explain recycling of wastes and its benefits. (04 Marks)  
b. Derive the expression for power developed due to wind. (06 Marks)  
c. Explain with diagram, dry steam geothermal power plant. (06 Marks)

### Module-4

- 7 a. Explain with sketch, two basin system of tidal power harnessing. (04 Marks)  
b. Draw sketch of down – draft gasifier and explain its working. Write its applications. (06 Marks)  
c. Describe the construction and working of floating dome type bio – gas plant and its materials aspects. (06 Marks)

OR

- 8 a. Briefly explain four problems faced in exploiting tidal energy. (04 Marks)  
b. Describe the construction and working of fixed dome type biogas plant and its material aspects. (06 Marks)  
c. With diagram, explain updraft gasifier and write its applications area. (06 Marks)

**Module-5**

- 9 a. Write advantages of sea wave power. (04 Marks)  
b. Explain how the ocean temperature differences can be used to generate electrical power using open cycle system. (06 Marks)  
c. Describe with diagram, principle of oscillating water column ocean wave machine. (06 Marks)

**OR**

- 10 a. Briefly explain types of devices for harnessing wave energy. (04 Marks)  
b. Describe the 'Closed – Cycle' OTEC system, with the help of diagram. (06 Marks)  
c. State the merits and demerits of OTEC plants. (06 Marks)

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