

CBCS SCHEME

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15EE51

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021 Management and Entrepreneurship

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 Management and Administration. (08 Marks)
b. Explain steps involved in planning. (08 Marks)

OR

- 2 a. Explain functions of management. (08 Marks)
b. Explain management as profession. (04 Marks)
c. Explain briefly about types of decisions. (04 Marks)

Module-2

- 3 a. Distinguish between centralization and decentralization. (08 Marks)
b. Explain steps in controlling. (08 Marks)

OR

- 4 a. Explain process of selection and recruitment. (08 Marks)
b. Explain briefly following:
(i) Committee (ii) Span of control (iii) Communication (08 Marks)

Module-3

- 5 a. Define the following:
(i) Social responsibility (ii) Business ethics (08 Marks)
(iii) Entrepreneur (iv) Intrapreneur (08 Marks)
b. Explain problems faced by entrepreneur. (08 Marks)

OR

- 6 a. Explain social responsibility of business towards different group. (08 Marks)
b. Explain entrepreneurship in India along with examples of development. (08 Marks)

Module-4

- 7 a. Define following: (i) Ancillary industry (ii) Tiny industry (04 Marks)
b. Explain policies and schemes of state level institutes. (06 Marks)
c. Explain impact of Globalization on SSI. (06 Marks)

OR

- 8 a. Explain the rôle of Small Scale Industries. (06 Marks)
b. Explain policies and schemes of (states or central) level institutes. (08 Marks)
c. Explain sickness to SSI industry. (02 Marks)

Module-5

- 9 a. Explain for project: (i) Market analysis (ii) Technical analysis (08 Marks)
b. Explain about PERT method. (08 Marks)

OR

- 10 a. Explain in detail the contents of project report. (08 Marks)
b. Explain CPM method for project management. (08 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, Jan./Feb. 2021 Microcontroller

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. With a neat block diagram, explain the function of each block of 8051 micro controller. (10 Marks)
b. Explain the memory organization in 8051. (06 Marks)

OR

- 2 a. What is stack? Explain the instructions used to access them. (10 Marks)
b. Explain the different addressing modes of 8051. Any three give an example for each of them. (06 Marks)

Module-2

- 3 a. Explain the following instructions of 8051 with examples:
i) XCHD A, @R_i ii) MOVC A, @A+PC iii) RL A iv) MUL AB v) DA A. (10 Marks)
b. What are assembler directives? Explain the functions of the assembler directives with an example for each. (06 Marks)

OR

- 4 a. Write 8051 ALP which checks whether the ten numbers stored from external RAM memory address, 2000H are odd/even. The program should store accordingly OOH/FFH from internal location 30H onwards. (10 Marks)
b. Write an ALP to toggle all bits of port 1 every 200ms. Assume that the crystal frequency is 11.0592MHz of 8051. (06 Marks)

Module-3

- 5 a. Write an 8051C program to read the content of port P₁. If it is greater than 200, wait for 250msec and send the data to port P₂. Otherwise wait for 150Msec and send the data to Port P₀. (10 Marks)
b. Discuss the data types in 8051C. (06 Marks)

OR

- 6 a. Write an assembly language program to generate 2kHz square wave on port 1.0 using timer 1, mode 1. Assume oscillator frequency of the μ c is 12MHz. (10 Marks)
b. Mention the difference between counter mode and timer mode of operation. With necessary format, explain the various bits of TMODSFR. (06 Marks)

Module-4

- 7 a. Explain how 8051 transmits the character serially using its UART. (06 Marks)
b. Write 8051 C program to transmit serially the message "SWITCH ON" or "SWITCH OFF" depending on the status of the simple switch connected to pin 1.2. Use 2400 baud rate, 1 stop bit, 8 data bit format and assume XTAL frequency as 11.0592 MHz. (10 Marks)

OR

- 8 a. Explain the interrupts of 8051 clearly mentioning the vector address and priorities. (06 Marks)
b. Write AL program that continuously gets 8 bit data from P₀ and sends it to P₁ while simultaneously creating a square wave of 200 μ s period on pin P2.1. Use timer 0, mode 2 to create the square wave. Assume that XTAL = 11.0592MHz. (10 Marks)

Module-5

- 9 a. Explain the features of ADC 0804. Also draw the pin diagram of the same mentioning the various pins. (06 Marks)
b. Write a C program to rotate the stepper motor in the clock wise for 4 steps and in the antilock wise for 6 steps. Show the relevant calculations. (10 Marks)

OR

- 10 a. Draw the block diagram to show how 8051 is connected to DAC 0808 at port P₁, using O/P buffer for DAC. Write an 8051 C program to generate a ramp signal (10 Marks)
b. Explain the any two modes of operation of 8255 along with control word format. (06 Marks)

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15EE53

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021

Power Electronics

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- With the help of circuits and waveforms, explain the various types of power electronic converters. (10 Marks)
 - Analyse the Reverse recovery characteristics of a diode and write equations of reverse recovery time t_{rr} and reverse recovery current I_{RR} . (06 Marks)

OR

- Explain the working operation of 1ϕ full wave bridge rectifier circuit with R load. With necessary waveforms. (08 Marks)
 - Mention the various types of power diodes and explain freewheeling diodes with switched RL load circuit along with various modes. (08 Marks)

Module-2

- With the help of necessary waveform, explain the switching characteristics of power MOSFET. (08 Marks)
 - A simple transistor switch is used to connect a 24V DC supply across a relay coil, which has a DC resistance of 200Ω . An input pulse of 0 to 5V amplitude is applied through a series base resistor R_B at the base so as to turn on the transistor switch. Sketch the device current waveform with reference to the input pulse. Calculate: i) I_{CS} ii) Value of resistor R_B , required to obtain over drive factor of 2. iii) Total power dissipation in the transistor. [Refer Fig Q3(b)]

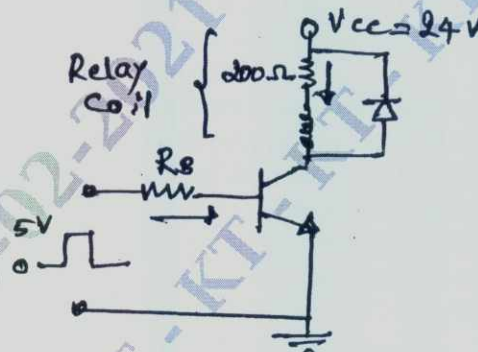


Fig Q3(b)

$$\begin{aligned}\beta &= 25 \text{ to } 100 \\ V_{CE(sat)} &= 0.2V \\ V_{BE(sat)} &= 0.7V\end{aligned}$$

(08 Marks)

OR

- What is the necessity of base drive control in a power transistor? Explain proportional base control. (08 Marks)
 - Write Merits, Demerits and Applications of power MOSFETs. (04 Marks)
 - With circuit diagram, explain electric isolation using pulse transformer. (04 Marks)

Module-3

- 5 a. Derive an expression for the anode current of a thyristor with the help of a two transistor analogy. (08 Marks)
- b. Distinguish between holding current and latching current of thyristor. (04 Marks)
- c. A SCR is connected in series with a 0.5H inductor and 20Ω resistance. A 100V DC voltage is applied to this circuit. If the latching current of the SCR is 4mA. Find the maximum width of the gate trigger pulse required to properly turn-on the SCR. [Refer Fig Q5(c)]

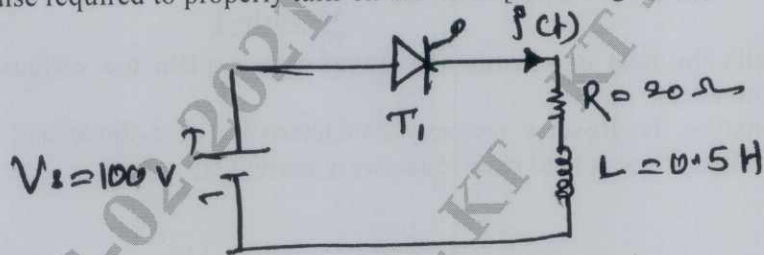


Fig Q5(c)

(04 Marks)

OR

- 6 a. What is the need for protection of thyristors? Explain how thyristors are protected against high $\frac{di}{dt}$ and $\frac{dv}{dt}$. (10 Marks)
- b. A string of series connected thyristors is to withstand a dc voltage of 16kV. The maximum leakage current and recovery charge differences of the thyristors are 10mA and 100μC respectively. The derating factor for steady state and transient voltage sharing are 20%. For a maximum steady state voltage sharing of 1kV. Determine :
- The steady voltage sharing resistance R for each thyristor
 - The transient voltage capacitance C_1 for each thyristor.

(06 Marks)

Module-4

- 7 a. With the help of circuit diagram and waveforms explain the working of 1φ fully controlled converter with inductive load. Derive the expression for rms output voltage and rms output current. (08 Marks)
- b. A single phase full wave A.C voltage controller operates on a single phase supply voltage of 230V rms, at 50Hz. If the triac is triggered at a delay angle of 45°, during each half cycle of input supply. [Refer Fig Q7(b)] Calculate :
- RMS value of output voltage
 - RMS value of output current
 - RMS value of Triac current
 - Input power factor.

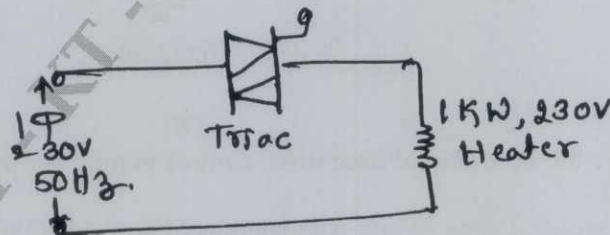


Fig Q7(b)

(08 Marks)

OR

- 8 a. Explain the working of a bidirectional A.C voltage controller with R load, with the help of neat circuit's diagram, and relevant waveforms. Derive the equation for $V_o(\text{RMS})$. (08 Marks)
- b. A 3ϕ full converter operated from 3ϕ , γ , connected 208V, 60Hz supply with $R_L = 10\Omega$. It is required to obtain 50% of the maximum possible output voltage. Calculate :
- Delay angle α
 - rms and average current
 - rms and average thyristor current
 - efficiency of rectification
 - Power factor.

(08 Marks)

Module-5

- 9 a. Explain the operation of step up chopper. (06 Marks)
- b. Analyse the performance parameters of DC choppers. (04 Marks)
- c. The 1ϕ full bridge inverter has a resistive load of $R = 2.4\Omega$, and the DC input voltage of $V_s = 48$ Volts. Determine :
- rms output voltage at the fundamental frequency
 - The output power
 - The peak and average currents of each transistor.

(06 Marks)

OR

- 10 a. Explain 1ϕ transistorized current source inverter with the help of necessary circuit and waveforms. Also write its advantages and disadvantages. (06 Marks)
- b. Write comparison between VSI and CSI. (04 Marks)
- c. A dc chopper has an input voltage of 200V and a load resistance of 8Ω . The voltage drop across thyristor is 2V, and the chopper frequency is 800 Hz. The duty cycle $\alpha = 0.4$. Find :
- Average output voltage
 - RMS output voltage
 - Chopper efficiency.

(06 Marks)

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15EE54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021 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. Define even and odd signals. Find the even and odd components of the signal :
 $x(n) = u(n) - 2u(n - 5) + u(n - 10)$. (06 Marks)
- b. Determine where the signal in Fig.Q1(b) is an Energy or a power signal and hence determine the corresponding value of power or energy of the signal.

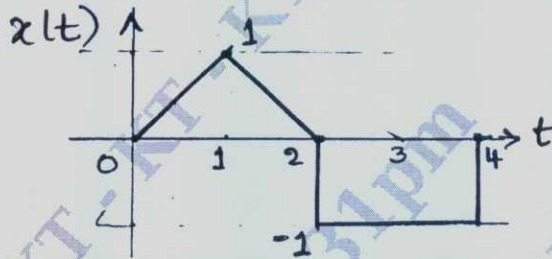


Fig.Q1(b)

- c. A discrete time system is represented as $y(n) = \log[x(n)]$. Identify whether the system is linear, time – invariant, Causal and Memoryless. (06 Marks)

OR

2. a. If $x(t)$ is a periodic signal, then show that : $\int_{\alpha}^{\beta} x(t)dt = \int_{\alpha+T}^{\beta+T} x(t)dt$. (02 Marks)
- b. Define the elementary signals $\delta(n)$ [impulse], $u(n)$ [unity] and $r[n]$ [ramp] and hence obtain the relation between them. (06 Marks)
- c. Consider a RC circuit as shown in Fig.Q2(c). Find the relation between the input $x(t)$ and output $y(t)$ for the system with $x(t) = V_s(t)$ and $y(t) = V_c(t)$. Determine whether the system is linear, time invariant, causal and stable.

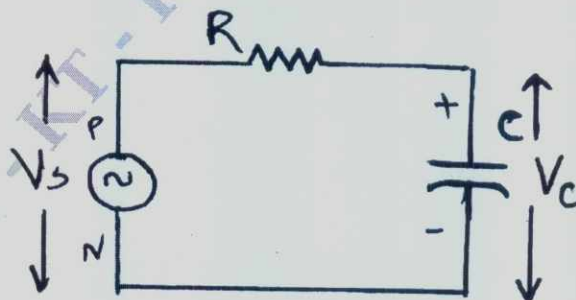


Fig.Q2(c)

(08 Marks)

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2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-2

3 a. Prove the following properties of convolution sum :

i) Associative

ii) Distributive property.

(04 Marks)

b. Obtain the convolution sum of $x(n) = \alpha^n u(n)$ and $h(n) = \beta^n u(n)$.

(06 Marks)

c. Draw the direct form I and direct form II for the following systems.

i) $y(n) - \frac{1}{2}y(n-1) + \frac{1}{4}y(n-2) = x(n) + 2x(n-1)$

ii) $2 \frac{d^2y(t)}{dt^2} + \frac{dy(t)}{dt} + 3y(t) = x(t) + \frac{d^2x(t)}{dt^2}$.

(06 Marks)

OR

4 a. Consider a continuous time LTI system has an input signal

$$x(t) = \begin{cases} A & 0 \leq t \leq T \\ 0 & \text{other values of } t \end{cases}$$

and has an impulse signal

$$h(t) = \begin{cases} A & 0 \leq t \leq 2T \\ 0 & \text{other value of } t \end{cases}$$

Find the output signal $y(t) = x(t) * h(t)$, using convolution integral.

(06 Marks)

b. Show that : $x(t) * u(t-t_0) = \int_{-\infty}^{(t-t_0)} x(t-t_0) dt$.

(03 Marks)

c. Find the complete response of a system described by the equation :

$y(n) - \frac{1}{4}y(n-1) - \frac{1}{8}y(n-2) = x(n) + x(n-1)$ with $y(-1) = 2$ and $y(-2) = -1$, as initial conditions, and input $x(n) = 2^n u(n)$.

(07 Marks)

Module-3

5 a. Plot the magnitude and phase spectrum for the Fourier transform of the signal :

$$x(t) = e^{-at|t|}$$

(08 Marks)

b. Show that :

If $x(t) \xrightarrow{FT} X(\omega)$, then $\frac{d}{dt}[x(t)] \xrightarrow{FT} j\omega \cdot X(\omega)$.

(04 Marks)

c. Find the inverse Fourier transform of the signal : $X(\omega) = \frac{j\omega + 12}{(j\omega)^2 + 5(j\omega) + 6}$.

(04 Marks)

OR

6 a. Find the Fourier transform of :

i) $x(t) = 1$ ii) $x(t) = u(t)$.

(06 Marks)

b. Calculate the energy of the signal : $x(t) = 4 \sin c\left(\frac{t}{5}\right)$ using Parsevats theorem.

(06 Marks)

c. Evaluate : $\int_{-\infty}^{\infty} \frac{4}{(w^2 + 1)^2} = dw$ using Fourier transform.

(04 Marks)

Module-4

- 7 a. Prove the modulation (time domain) property of Discrete Time Fourier Transform (DTFT). (04 Marks)
- b. Evaluate the DTFT of the signal : $\left(\frac{1}{2}\right)^n u(n-4)$. (04 Marks)
- c. Given input signal : $x(n) = n \cdot \left(-\frac{1}{2}\right)^n \cdot u(n)$, without evaluating $x(\Omega)$, find $y(n)$, if $y(\Omega)$ is given by ;
- i) $Y(\Omega) = e^{j3\Omega} \cdot X(\Omega)$
- ii) $Y(\Omega) = \frac{d}{d\Omega} [X(\Omega)]$
- iii) $Y(\Omega) = \frac{d}{d\Omega} \left[e^{-j2\Omega} \cdot [X(e^{j(n+\frac{\pi}{4}})] - X(e^{j(n-\frac{\pi}{4}})] \right]$. (08 Marks)

OR

- 8 a. Obtain the DTFT of a rectangular pulse signal : $x(n) = \begin{cases} 1 & \text{for } |n| \leq m \\ 0 & \text{for } |n| > m \end{cases}$ and plot its spectrum. (06 Marks)
- b. Find the inverse Fourier transform of : $X(\Omega) = \cos^2(\Omega)$. (04 Marks)
- c. Compute the frequency response and the impulse response of the system described by the difference equation : $y(n) + \frac{1}{2}y(n-1) = x(n) - 2x(n-1)$. (06 Marks)

Module-5

- 9 a. Define Z-transform of a discrete time signal $x(n)$. Determine the z-transform of the signal : $x(n) = \alpha^n u(n) + \beta^n u(-n-1)$. (06 Marks)
- b. Prove the following properties of Z-transform :
- i) Convolution (time domain) property
- ii) Differentiation (z - domain) property. (04 Marks)
- c. Find the inverse Z-transform for the following signals :

i) $x(z) = \frac{\left(1 - \frac{1}{2}z^{-1}\right)}{\left(1 + \frac{3}{4}z^{-1} + \frac{1}{8}z^{-2}\right)}$

ii) $x(z) = \sum_n [1 + z^{-1}]$. (06 Marks)

OR

- 10 a. What is ROC? Specify the properties of ROC and mention its significance. (04 Marks)
- b. Find the convolution of $x_1(n) = \{2, 3, 4\}$ and $x_2(n) = \{1, 5, 5\}$ using Z-transform. (04 Marks)
- c. A linear time invariant system is described by the difference equation : $y(n) = ay(n-1) + x(n)$.
- i) Determine the transfer function of the system
- ii) Determine the impulse response of the system
- iii) Determine the step response of the system. (08 Marks)

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15EE553

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021 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. What is estimating and what are the importances of estimating and coasting? (06 Marks)
b. Write a short note on comparative statement. (06 Marks)
c. State the important facts, which an estimator should know for preparing an internal wiring estimate. (04 Marks)

OR

- 2 a. List out guidelines for inviting tenders. (08 Marks)
b. Briefly explain the modes of tendering. (08 Marks)

Module-2

- 3 a. Mention the various types of wires or cables usually used in internal wiring of buildings. (06 Marks)
b. Write a short note on General Specifications of cables. (06 Marks)
c. Name the various accessories and fitting requires for conduit wiring. (04 Marks)

OR

- 4 a. What are the advantages and disadvantages of fuse? (06 Marks)
b. What are the general rules to be followed for internal wiring? (10 Marks)

Module-3

- 5 a. Write a short notes on service lines. (06 Marks)
b. Prepare a list of material and estimate the cost for providing service connection to a single storey building at 240V single phase 50Hz having a light and fan load of 5kW. The supply is to be given from an overhead line 20m away from the building. (10 Marks)

OR

- 6 a. List out important consideration regarding motor installations. (06 Marks)
b. A 10hp, 415V, 3-phase, 50Hz induction motor is to be installed in a workshop, the plan of which is shown below in figure 6(b). Estimate the quality of material required and give its approximate cost. The wiring is to be surface conduit. (10 Marks)

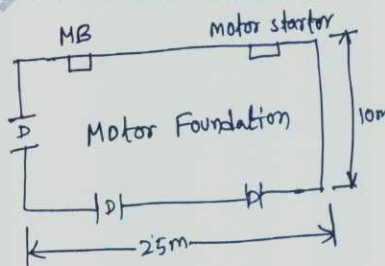


Fig Q6(b)

1 of 2

(10 Marks)

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Module-4

- 7 a. Draw and explain typical ac electrical power supply system. (06 Marks)
b. Estimate the cost of adding 132KV bay at 132kV grid substation. (10 Marks)

OR

- 8 a. What are the main requirements of the line supports? Describe factors governing height to pole? (06 Marks)
b. A pole for an overhead 11KV, 3-phase 50Hz line is required to be earthed and a stay is to be provided prepare a list of material required and estimate the cost. (10 Marks)

Module-5

- 9 a. List advantages and disadvantage of outdoor substation over indoor substation. (06 Marks)
b. Draw a neat layout of 132/33kV substation having two 132KV incoming lines and four 33KV outgoing lines. Show the essential equipment in the diagram. (10 Marks)

OR

- 10 a. Explain the classification of substations. (06 Marks)
b. Prepare a list of material required and workout the cost of installation of a 400KVA indoor type, 11/0.433KV transformer. (10 Marks)
