

CBCS SCHEME

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18ES51

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

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Give different definitions of management as interpreted by management scholars. (07 Marks)
b. Discuss modern approaches of management. (06 Marks)
c. Describe the levels of management. (07 Marks)

OR

- 2 a. Discuss various steps involved in planning. (07 Marks)
b. List some of the standing plans and single use plans and explain. (06 Marks)
c. Explain steps involved in rational decision making. (07 Marks)

Module-2

- 3 a. Explain principles of organization. (07 Marks)
b. Discuss factors affecting span of management. (06 Marks)
c. Distinguish between Job Analysis, Job description and Job specification. (07 Marks)

OR

- 4 a. Illustrate Maslow's theory of hierarchy of needs. (07 Marks)
b. Discuss essentials of effective control system. (06 Marks)
c. Describe different leadership styles from authority point of view. (07 Marks)

Module-3

- 5 a. Discuss the benefits of social audit. (07 Marks)
b. What do you understand by business ethics? What are the factors which affect the decision is ethical or unethical? (06 Marks)
c. Describe Corporate Governance. Explain the benefits of Corporate Governance. (07 Marks)

OR

- 6 a. Identify different types of barriers to Entrepreneurship. (07 Marks)
b. Explain the need of capacity building to Entrepreneurship. (06 Marks)
c. Discuss the contribution of Entrepreneurship Development cycle. (07 Marks)

Module-4

- 7 a. Explain in brief, the characteristics of family owned business in India. (07 Marks)
b. Discuss "13-circle" model of family business. (06 Marks)
c. What are the various types of family business? Explain. (07 Marks)

OR

- 8 a. List four fundamental features of business opportunities and explain. (07 Marks)
b. Describe various methods of generating new ideas. (06 Marks)
c. Explain market entry strategies. (07 Marks)

Module-5

- 9 a. Explain the need and scope of business plan. (07 Marks)
b. List the contents of a business plan and explain. (06 Marks)
c. Discuss the role of Angel Investors and Debt financing in financing a business. (07 Marks)

OR

- 10 a. Explain the growth and development of MSME in India. (07 Marks)
b. Explain the importance of Network Analysis in project design and execution. (06 Marks)
c. Compare and Contrast Program Evaluation Review Technique (PERT) with Critical Path Method (CPM). (07 Marks)

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18EC52

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

Digital Signal Processing

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Show that the multiplication of two DFT's leads to circular convolution of the corresponding time sequences. (08 Marks)
- b. Compute the N – point OFT's of the signals :
- i) $x(n) = \begin{cases} 1, & 0 \leq n \leq \frac{N}{2} - 1 \\ 0, & \frac{N}{2} \leq n \leq N - 1 \end{cases}$
- ii) $x(n) = \cos \frac{2\pi}{N} k_0 n, 0 \leq n \leq N-1.$ (07 Marks)
- c. Given $x(n) = \{1, 2, 3, 4\}$, find $y(n)$, if $y(k) = x((k-2))_4.$ (05 Marks)

OR

- 2 a. State and prove the Circular time shift property of DFT. (06 Marks)
- b. Determine the circular convolution of $x_1(n) = \{1, 2, 3, -1\}$ and $x_2(n) = \{4, 3, 2, -2\}$, using Time domain formula. Verify the result using Frequency domain approach. (09 Marks)
- c. For the sequence $x(n) = \{-1, 2, 3, 0, -4, 1, 2, -3\}$, Calculate
- i) $\sum_{k=0}^7 x(k)$ and ii) $\sum_{k=0}^7 |x(k)|^2$, without computing the DFT. (05 Marks)

Module-2

- 3 a. Write the computational procedure to find the filtered output using Overlap Add method. (07 Marks)
- b. Find the 8 – point DFT of the sequence $x(n) = \{-1, 0, 2, 3, -4, -2, 0, 5\}$, using radix – 2 DIT – FFT algorithm. (09 Marks)
- c. Compare the complex additions and complex multiplications for the direct computation of DFT versus the FFT algorithm for $N = 128.$ (04 Marks)

OR

- 4 a. Derive the radix – 2 DIF – FFT algorithm and draw the signal flow graph for $N = 8.$ Comment on the number of computations required to find N – point DFT. (07 Marks)
- b. Using Overlap save method, find the output of a filter whose impulse response $h(n) = \{1, -2, 3\}$ and input $x(n) = \{2, 3, -1, 0, 5, 2, -3, 1\}.$ Use 6 – point circular convolution. (09 Marks)
- c. Given $X(k) = \{1, j4, 1, -j4\}$, find $x(n)$ using radix – 2 DIT – FFT algorithm. (04 Marks)

Module-3

- 5 a. Design an FIR filter for the following desired frequency response

$$H_d(w) = \begin{cases} e^{-j3w}, & \text{if } |w| \leq \pi/4 \\ 0, & \text{if } |w| > \pi/4 \end{cases}$$

Use the Hamming window function, obtain the frequency response of the designed FIR filter. (10 Marks)

- b. For the System function $H(z) = 1 + 2.8z^{-1} + 3.4z^{-2} + 1.7z^{-3} + 0.4z^{-4}$. Obtain the Lattice coefficients and sketch the Lattice structure. (10 Marks)

OR

- 6 a. Find the Impulse response of an FIR filter with the following desired frequency response,

$$H_d(w) = \begin{cases} 0 & ; \text{ if } |w| \leq \pi/6 \\ e^{-j4w} & ; \text{ if } |w| > \pi/6 \end{cases}$$

Use Rectangular window function. Draw the direct form structure for the designed filter. (10 Marks)

- b. Consider an FIR Lattice filter coefficients $K_1 = 0.65$, $K_2 = 0.5$, $K_3 = 0.9$. Find its impulse response and draw the direct form structure. (10 Marks)

Module-4

- 7 a. Define the First order analog low pass filter prototype. How this prototype is transformed into a different filter types. (05 Marks)
- b. Design a Second order digital low pass Butterworth filter with a cutoff frequency of 3.4 kHz at a sampling frequency of 8000Hz. Draw the direct Form – II structure of this filter. Use Bilinear transformation. (10 Marks)
- c. Discuss the general mapping properties of bilinear transformation and show the mapping between the S – plane and the the Z – plane. (05 Marks)

OR

- 8 a. Define the Normalized low pass prototype function of Butterworth filter and derive the expression for the filter order. (05 Marks)
- b. Using Bilinear transformation, design a digital low pass Butterworth filter with the following specifications : Sampling frequency : 8000Hz , 3 dB attenuation at 1.5 kHz. 10 dB stop band attenuation at 3kHz. (10 Marks)
- c. Realize the following digital filter using direct Form – II

$$H(z) = \frac{0.7 + 1.4z^{-1} + 0.7z^{-2} + 0.5z^{-3}}{1 + 1.3z^{-1} + 0.5z^{-2} + 0.7z^{-3} + 0.3z^{-4}} \quad (05 \text{ Marks})$$

Module-5

- 9 a. With a neat diagram, explain the Harvard architecture used in DS processors. (06 Marks)
- b. Illustrate the operation of circular buffers used for address generation in DS processors. (07 Marks)
- c. Convert the following decimal numbers into the floating point representation
i) 0.640492×2^{-2} ii) -0.638454×2^5 .
Use 4 – bits to represent exponent and 12 – bits for mantissa. (07 Marks)

OR

- 10 a. With a neat diagram, explain the basic architecture of TMS320C54X family DS processors. (10 Marks)
- b. Describe the IEEE single precision floating point format used in DS processors. (05 Marks)
- c. Find the signed Q – 15 representation for the decimal number 0.560123. (05 Marks)

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18EC53

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

Principles of Communication System

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain in detail the working of switching modulator with diagram and necessary derivations. (10 Marks)
- b. Explain the generation of DSBSC modulated waves using ring modulator. (10 Marks)

OR

- 2 a. Illustrate the amplitude modulation process and draw the waveform for modulation index $M > 1$ & $M < 1$. (08 Marks)
- b. Explain with relevant block diagram and working of FDM system. (08 Marks)
- c. A 400 W carrier is modulated on a depth of 75 percent. Calculate the total power in the modulated wave of following form AM.
(i) Double Side Band with Full Carrier (DSBFC)
(ii) Double Side Band Suppressed Carrier (DSBSC) (04 Marks)

Module-2

- 3 a. Derive the equations for frequency modulated wave. Define modulation index and frequency deviation. (12 Marks)
- b. A 93.2 MHz carrier is frequency modulated by 5 kHz sine wave the resultant FM signal has frequency deviation of 40 kHz:
(i) Find the carrier swing of FM signal
(ii) What are highest and lowest frequencies of FM signal?
(iii) Calculate the modulation index of FM
(iv) B.W of FM signal (08 Marks)

OR

- 4 a. Explain the Narrow band FM with relevant expressions and phasor diagrams. (10 Marks)
- b. Discuss the nonlinear effects in FM system. (06 Marks)
- c. Assume that the maximum value of frequency deviation Δf is fixed at 50 kHz for a certain FM transmission. Given that the maximum modulating frequency is 15 kHz. Calculate the necessary transmission bandwidth. (04 Marks)

Module-3

- 5 a. Derive the expression for figure of merit for DSB-SC receiver. (10 Marks)
- b. Find figure of merit for single tone FM. (06 Marks)
- c. Write short notes on:
(i) Shot Noise
(ii) White Noise (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.

OR

- 6 a. With FM receiver model, derive the expression for figure of merit. (10 Marks)
- b. Briefly explain the following as application to FM:
 (i) Pre-emphasis (06 Marks)
 (ii) De-emphasis (04 Marks)
- c. An AM receiver operating with a sinusoidal modulating signal has a following specifications: $m = 0.8$ and $(\text{SNR})_0 = 30$ dB. What is carrier to noise ratio? (04 Marks)

Module-4

- 7 a. State sampling theorem and explain same with neat sketches and equation. (10 Marks)
- b. With neat block diagram, explain the TDM. (06 Marks)
- c. A Compact Disc (CD) audio signals digitally using PCM. Assume the audio signal bandwidth to be 20 kHz.
 (i) What is the Nyquist rate?
 (ii) If the Nyquist samples are quantized to $L = 65,536$ levels and then binary coded, determine the number of bits required to encode a sample. (04 Marks)

OR

- 8 a. What are advantages digitizing the analog signals? (06 Marks)
- b. With a block diagram, explain the generation and detection of PPM. (10 Marks)
- c. Discuss Bandwidth – Noise trade off. (04 Marks)

Module-5

- 9 a. With a neat diagram, explain the basic elements of a PCM. (08 Marks)
- b. Discuss the concept and operation of delta modulation in detail. (08 Marks)
- c. PCM system uses uniform quantizer followed by a 7 bit binary encoder. The bit rate of the system is 50×10^6 bps. What is minimum message bandwidth? (04 Marks)

OR

- 10 a. Write a note on MPEG + Video. (10 Marks)
- b. Draw the resulting waveform for 01101001 using unipolar NRZ, polar NRZ, unipolar Z2, Bipolar RZ. (06 Marks)
- c. A TV signal with a bandwidth of 4.2 MHz is transmitted using binary PCM. The number of representation level is 512. Calculate:
 (i) Codeword length
 (ii) Final bit rate
 (iii) Transmission bandwidth (04 Marks)

CBCS SCHEME

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18EC54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021 Information Theory and Coding

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Derive the expression for average information contents of symbols in long independent sequence. (06 Marks)
- b. Find the relationship between Hartley's, nats and bits. (06 Marks)
- c. A code is composed of dots and dashes. Assuming that a dash is 3 times as long as a dot and has one-third the probability of occurrence. Calculate:
 - (i) The information in a dot and dash
 - (ii) The entropy of dot-dash code
 - (iii) The entropy rate of information, if a dot lasts for 10 ms and this time is allowed between symbols. (08 Marks)

OR

- 2 a. Consider a second order mark-off source as shown in Fig.Q2(a). Here $s = \{0, 1\}$ and states are $A\{0, 0\}$, $B = \{0, 1\}$, $C = \{1, 0\}$ and $D = \{1, 1\}$.
 - (i) Compute the probability of states
 - (ii) Compute the entropy of the source

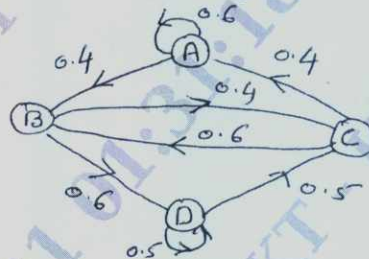


Fig.Q2(a)

- (i) (10 Marks)
 - (ii) (10 Marks)

Module-2

- 3 a. A Discrete Memory Source (DMS) has an alphabet $X = \{x_1, x_2, x_3, x_4, x_5, x_6\}$ and source statistics. $P = \{0.3, 0.25, 0.20, 0.12, 0.08, 0.05\}$. Construct binary Huffman code. Also find the efficiency and redundancy of coding. (10 Marks)
- b. Apply Shannon encoding algorithm to the following set of messages and obtain code efficiency and redundancy. (10 Marks)

m_1	m_2	m_3	m_4	m_5
1/8	1/16	3/16	1/4	3/8

OR

- 4 a. A source having alphabet $s = \{s_1, s_2, s_3, s_4, s_5\}$ produces a symbols with respective probabilities $1/2, 1/6, 1/6, 1/9, 1/18$.
 - (i) When the symbols are coded as shown 0, 10, 110, 1110, 1111 respectively.
 - (ii) When the code is as 00, 01, 10, 110, 111
 Find code efficiency and redundancy (12 Marks)
- b. State and prove Kraft McMillan inequality. (08 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. Discuss the binary Erasure Channel (BEC) and also derive channel capacity equation for BEC. (08 Marks)
- b. A channel has the following characteristics

$$P\left[\frac{Y}{X}\right] = \begin{array}{c} Y_1 \quad Y_2 \quad Y_3 \quad Y_4 \\ \begin{array}{l} X_1 \begin{bmatrix} \frac{1}{3} & \frac{1}{3} & \frac{1}{6} & \frac{1}{6} \\ \frac{1}{6} & \frac{1}{6} & \frac{1}{3} & \frac{1}{3} \end{bmatrix} \\ X_2 \end{array} \end{array}$$

Find $H(X)$, $H(Y)$, $H(X, Y)$ and channel capacity if $r = 1000$ symbols/sec. (12 Marks)

OR

- 6 a. Determine the rate of transmission of information through a channel whose noise characteristics is as shown in Fig.Q6(a).

Given $P(X_1) = P(X_2) = \frac{1}{2}$. Assume $r_s = 10,000$ symbols/sec.

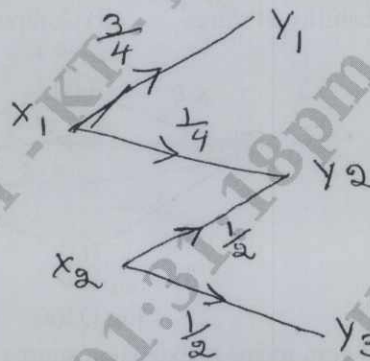


Fig.Q6(a)

- b. What is mutual information? Mention its properties and prove that (10 Marks)

$$I(X:Y) = H(X) - H\left(\frac{X}{Y}\right); \quad I(X:Y) = H(Y) - H\left(\frac{Y}{X}\right). \quad (10 \text{ Marks})$$

Module-4

- 7 a. For a (6, 3) linear block code the check bits are related to the message bits as per the equations given below:

$$c_1 = d_1 \oplus d_2$$

$$c_2 = d_1 \oplus d_2 \oplus d_3$$

$$c_3 = d_2 \oplus d_3$$

- i) Find the generator matrix G
- ii) Find all possible code words
- iii) Find error detecting and error correcting capabilities of the code. (12 Marks)
- b. The generator polynomial of a (7, 4) cyclic code is $g(x) = 1 + x + x^2$. Find the 16 code words of this code by forming the code polynomial $v(x)$ using $V(X) = D(X)G(X)$ where $D(X)$ is the message polynomial. (08 Marks)

OR

- 8 a. Design a linear block code with a minimum distance of 3 and a message block size of 8 bits. (08 Marks)
- b. For a (6, 3) cyclic code, find the following: (12 Marks)
- $G(x)$
 - G in systematic form
 - All possible code words
 - Show that every code polynomial is multiple of $g(x)$.

Module-5

- 9 a. For the convolution encoder shown in Fig.Q9(a) the information sequence is $d = 10011$. Find the output sequence using the following two approaches. (10 Marks)
- Time domain approach
 - Transfer domain approach

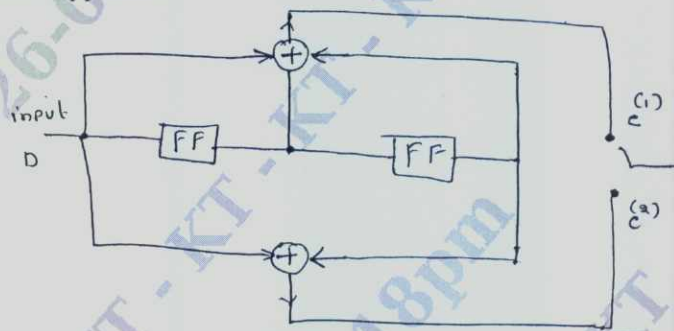


Fig.Q9(a)

- b. Consider a (3, 1, 2) convolution encoder with $g^{(1)} = 110$, $g^{(2)} = 101$ and $g^{(3)} = 111$. (10 Marks)
- Draw the encoder diagram
 - Find the code word for message sequence (11101) using Generator matrix and Transfer domain approach.

OR

- 10 a. Consider the rate $r = \frac{1}{2}$ and constraint length $K = 2$ convolution encoder shown in Fig.Q10(a). (14 Marks)
- Draw the state diagram.
 - Draw the code tree
 - Draw Trellis diagram,
 - Trace the path through the tree that corresponds to the message sequence {1, 0, 1}.

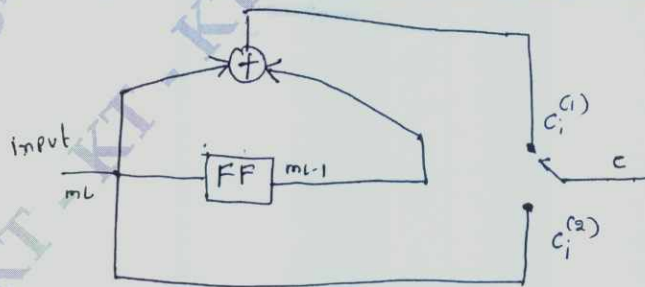


Fig.Q10(a)

- b. Explain Viterbi decoding. (06 Marks)

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

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. State and explain Coulomb's law in vector form. (05 Marks)
- b. Derive the relationship between dot products between unit vectors of the three coordinate systems. Transform the following vectors to spherical system at the point given :
 - i) $10a_x$ at $P(3, 2, 4)$
 - ii) $10a_y$ at $Q(5, 30^\circ, 4)$ (07 Marks)
- c. Four 10nc positive charges are located in $z = 0$ plane at the corners of a square 8cm on a side. A fifth 10nc charge is located at a point 8cm distant from other charges. Calculate the magnitude of total force on this fifth charge for $E = E_0$. (08 Marks)

OR

- 2 a. Using Coloumb's law, derive the expression for electric field Intensity 'E' due to an infinite sheet of charge of surface charge density $\rho_s \text{ c/m}^2$. (08 Marks)
- b. Four uniform sheets of charge are located as 20 Pc/m^2 at $y = 7$; -8 Pc/m^2 at $y = 3$; 6 P c/m^2 at $y = -1$; -18 Pc/m^2 at $y = -4$. Find E at i) $P_A(2, 6, -4)$ ii) $P_B(10^6, 10^6, 10^6)$. (06 Marks)
- c. Find the net outward flux (ψ) through the surface of a cube 2m on an edge centered at origin if $D = 5x^2a_x + 10za_z \text{ c/m}^2$. (The edges of cube are parallel to coordinate axes). (06 Marks)

Module-2

- 3 a. State and prove Gauss law in Integral form. (05 Marks)
- b. Find the volume charge density at the points indicated if
 - i) $D = 4\rho z \sin \phi a_\rho + 2\rho z \cos \phi a_\phi + 2\rho^2 \sin \phi a_z \text{ c/m}^2$ at $P_A\left(1, \frac{\pi}{2}, 2\right)$
 - ii) $D = \sin\theta \cos \phi a_r + \cos\theta \text{ Cos}\phi a_\phi - \sin \phi a_\theta \text{ c/m}^2$ at $P_B\left(2, \frac{\pi}{3}, \frac{\pi}{6}\right)$ (07 Marks)
- c. Evaluate both sides of Divergence Theorem if $D = \frac{5r^2}{4}a_r \text{ c/m}^2$ in spherical co-ordinate for the volume enclosed between $r = 1\text{m}$ and $r = 2\text{m}$. (08 Marks)

OR

- 4 a. Find the work done in moving a $5\mu\text{c}$ charge from origin to $P(2, -1, 4)$ through $E = 2xyza_x + x^22a_y + x^2y a_z \text{ V/m}$ via the path :
 - i) Straight line segments $(0, 0, 0)$ to $(2, 0, 0)$ to $(2, -1, 0)$ to $(2, -1, 4)$
 - ii) Straight line $x = -2y$; $z = 2x$. (08 Marks)
- b. Find 'E' at $P(3, 60^\circ, 25^\circ)$ in free space, given $V = \frac{60 \sin \theta}{r^2} \text{ V}$. (06 Marks)
- c. Derive equation of continuity. Given $J = -10^6 z^{1.5} a_z \text{ A/m}^2$ in a region $0 \leq \rho \leq 20\mu\text{m}$, find the total current crossing a surface $z = 0.1\text{m}$. (06 Marks)

Module-3

- 5 a. Derive the expression for capacitance of a cylindrical capacitor using Laplace equation. (08 Marks)
 b. Assume $V = V_0$ at $\rho = a$ and $V = 0$ at $\rho = b$, $b > a$. In spherical co-ordinate $V = 865$ V at $r = 50$ cm and $E = 748.2 a_r$ at $r = 85$ cm. Determine the location of voltage reference if potential depends only on 'r'. (08 Marks)
 c. Verify whether the potential function $V = 2x^2 - 3x^2 + z^2$ satisfies Laplace equation. (04 Marks)

OR

- 6 a. Derive the expression for magnetic field intensity 'H' at the centre of a square current carrying loop of I amps with side 'L' meters using Biot Savart's law. (08 Marks)
 b. Given $H = \frac{x+2y}{z^2} a_y + \frac{2}{z} a_z$ A/m. find J. Use J to find total current passing through the surface $z = 4$, $1 \leq x \leq 2$, $3 \leq y \leq 5$. (08 Marks)
 c. Explain the concept of scalar and vector magnetic potential. (04 Marks)

Module-4

- 7 a. The point charge $Q = 18$ nc has a velocity of 5×10^6 m/s in the direction $a_v = 0.6 a_x + 0.75 a_y + 0.3 a_z$. Calculate the magnitude of the force exerted on the charge by the field.
 i) $B = -3a_x + 4a_y + 6a_z$ mT
 ii) $E = -3a_x + 4a_y + 6a_z$ kV/m (08 Marks)
 b. The magnetization in a magnetic material for which $\chi_m = 8$ is $150z^2 a_x$ A/m. At $z = 4$ cm, find the magnitude of i) J ii) J_T iii) J_B . (06 Marks)
 c. Derive the expression for the force between two differential current elements. (06 Marks)

OR

- 8 a. Derive the expression for the boundary conditions between two magnetic medias. (06 Marks)
 b. Let the permittivity be 5μ H/m in region A where $x < 0$ and 20μ H/m in region B where $x > 0$. If $K = 150a_y - 200a_z$ A/m at $x = 0$ and $H_A = 300a_x - 400a_y + 500a_z$ A/m. Find : i) $|H_{tA}|$ ii) $|H_{nA}|$ iii) $|H_tB|$ iv) $|H_{nB}|$. (08 Marks)
 c. A circular loop of radius 10cm radius is located in $x - y$ plane in a magnetic field $B = 0.5 \cos(377t) (3a_y + 4a_z)$ T. Determine the voltage induced in the loop. (06 Marks)

Module-5

- 9 a. What is the inconsistency of Ampere's law with continuity equation? Derive the modified Ampere's law by Maxwell for time varying fields. (06 Marks)
 b. Given $E = E_m \sin(\omega t - \beta z) a_y$ V/m, find i) D ii) B iii) H. sketch E and H at $t = 0$. (08 Marks)
 c. Prove that the conduction current is equal to the displacement current between the two plates for $V = V_0 e^{j\omega t}$ in a parallel plate capacitor. (06 Marks)

OR

- 10 a. Show that the intrinsic impedance of the perfect dielectric $\eta = \frac{|E|}{|H|} = \sqrt{\frac{\mu}{\epsilon}}$ and show that its value in free space is 377Ω . (08 Marks)
 b. A uniform plane wave of a frequency 300MHz travels in +x direction in a lossy medium with $E_r = 9$, $\mu_r = 1$ and $\sigma = 10$ mhos/m. Calculate γ , α , β and η . (06 Marks)
 c. State and prove Poynting theorem. (06 Marks)

CBCS SCHEME

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18EC56

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

Verilog HDL

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain the typical design flow for VLSI IC circuit using block diagram. (08 Marks)
- b. Explain the trends in HDLs (Hardware Description Languages). (04 Marks)
- c. Apply the bottom-up methodology to demonstrate the design of 4-bit ripple carry counter. (08 Marks)

OR

- 2 a. Define Module and Instance. Describe 4 different levels of abstractions used in Verilog HDL to describe target design. (10 Marks)
- b. Explain top down design methodology and bottom up design methodology. (10 Marks)

Module-2

- 3 a. What are system tasks and compiler directives? Explain with example. (08 Marks)
- b. Check the correctness of the following legal strings. If not, write the correct strings.
 - i) "This is a string displaying the % sign"
 - ii) "Out = in1 + in2"
 - iii) "Please ring a bell \ 007"
 - iv) "This is a backslash \ character \ n"(04 Marks)
- c. Declare the following variables in verilog:
 - i) An 8-bit vector net called a_in
 - ii) A 32 bit storage register called address. Bit 31 must be in MSB. Set the value of the reg. to a 32 bit decimal number equal to 3.
 - iii) An integer called count
 - iv) A time variable called snap_shot
 - v) An array called delays, Array contains 20 elements of the type integer
 - vi) A memory MEM containing 256 words of 64 bits each
 - vii) A parameter cache-size equal to 512.(08 Marks)

OR

- 4 a. With a neat block diagram, explain the components of a verilog module by highlighting mandatory blocks. (08 Marks)
- b. Explain the port connection rules of verilog HDL. (08 Marks)
- c. A 4-bit parallel shift register has I/O pins as shown in Fig.Q.4(c) below. Write the module definition for this module shift_reg. Include the list of ports and port declaration. (04 Marks)

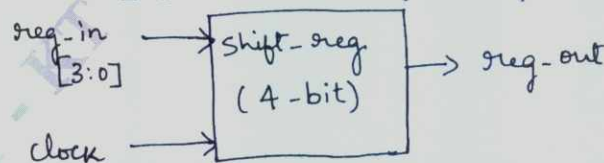


Fig.Q.4(c)

Module-3

- 5 a. Use gate level description of verilog HDL to design 4:1 MUX truth table, gate level block, logic expression and logic diagram. Write the stimulus block. (10 Marks)
 b. Write gate level description to implement $y = ab + c$ with 5 and 4 time units of gate delay for AND and OR gate respectively. Also write the stimulus block and simulation waveforms. (10 Marks)

OR

- 6 a. Write the dataflow modeling verilog code for 4-to-1 multiplexer using
 i) Logic equation ii) Conditional operator. (10 Marks)
 b. Explain assignment delay, implicit assignment delay and net declaration delay for continuous assignment statements with examples. (04 Marks)
 c. Write a dataflow level verilog code using + and { } operators for 4-bit full adders. (06 Marks)

Module-4

- 7 a. Explain the blocking assignments and non-blocking assignment statements with relevant examples. (08 Marks)
 b. Explain briefly the different types of event based timing control in verilog. (08 Marks)
 c. Write a note on the following loop statements:
 i) While loop ii) Forever loop. (04 Marks)

OR

- 8 a. Write a verilog behavioral code for 4 to 1 MUX using CASE statement. (08 Marks)
 b. Explain the sequential and parallel blocks with examples. (08 Marks)
 c. Define a function to multiple two 4-bit numbers 'a' and 'b'. The output is an 8 bit value. Invoke function by using stimulus and check results. (04 Marks)

Module-5

- 9 a. Write a note on:
 i) Assign and deassign
 ii) Overriding parameters. (10 Marks)
 b. Create a design that uses the full adder. Use a conditional compilation ('if def.). Compile the fulladder 4 with def param statement if the text macro DPARAM is defined by the 'define statement; otherwise, compile the Fulladder4 with module instance parameter values. (06 Marks)
 c. What will be the output of the \$display statement shown below
 Module TOP;
 A a1();
 end module
 Module A;
 B b1();
 end module
 Module B;
 initial
 \$display {"I am inside instance % m"}; end module. (04 Marks)

OR

- 10 a. With a neat flow chart explain computer-aided logic synthesis process. (10 Marks)
 b. Write RTL description for magnitude comparator. (06 Marks)
 c. What is logic synthesis? (04 Marks)

CBCS SCHEME

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Question Paper Version : C

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

Environmental Studies

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 100

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the hundred questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

-
1. The primary source of Green House Gases (GHG) is
a) Wind b) Fossil fuel c) Water d) Green plants
 2. The Kyoto protocol was adopted at the
a) Third conference of UNFCCC in 1997
b) Convention on the trans boundary effects of industrial accidents
c) United nations framework convention on climate change in 1992
d) convention on Biological diversity
 3. Which one of following is not a green house gas?
a) Water vapour b) Oxygen c) Methane d) Carbon monoxide
 4. E.T.S stands for
a) Emission Tracking system b) Europe Trading System
c) Environmental Tracking System d) Engine Tracking System
 5. The primary cause of acid rain around the world is due to
a) Carbon dioxide b) Sulphur dioxide c) Carbon monoxide d) Ozone
 6. Ozone layer is present in
a) Troposphere b) Stratosphere c) Mesosphere d) Thermosphere
 7. Sustainable development means
a) Meeting present needs without compromising on future needs
b) Progress in human well beings
c) Balance between human needs and ability of earth to provide the resources
d) All the above

8. Which of the following element make e-waste hazardous in nature?
a) Lead b) Glass c) Plastic d) Iron
9. What is the hazardous pollutant released from LED?
a) Arsenic b) Barium c) Cobalt d) Cadmium
10. Cytotoxic and expired drugs are disposed off by
a) Dumping b) Autoclave
c) Incineration d) Chemical disinfection
11. Eco-toxicology is study of
a) Chemical interaction of organism and environment
b) Physical interactions of organism and environment
c) Thermal interaction of organism and environment
d) Biological interaction organism and environment
12. What is the 1st step in primary treatment plants?
a) Fine screening b) Course screening c) Chlorination d) Oxidation
13. What are the sources of air pollutants in the atmosphere?
a) Coal fired power station b) Vehicle exhaust
c) Industries d) Coal
14. Which of the following chemicals damage the ozone layer?
a) Polyvinyl chloride b) Chlorofluorocarbons
c) DDT d) Hydroflurocarbons
15. Which of these energy source is renewable?
a) Wind b) Nuclear c) Coal d) Oil
16. Which one of the following is a great achievement of the Chipko movement?
a) More trees are planted b) Development in Himalayan region
c) Successfully resisted deforestation d) Soil erosion gets declined
17. The percentage of forest cover in India is
a) 14.69% b) 15.39% c) 19.39% d) 19.67%
18. GIS stands for
a) Geographic Information System b) Generic Information System
c) Geological Information System d) Geograhic Information Sharing
19. The effect of Acid Rain is
a) Reduces soil fertility b) Increases atmospheric temperature
c) Causing respiratory problem d) Skin cancer
20. Environmental protection is reasonability of
a) Government of India b) NGO
c) Individual d) All of these
21. People who are exposed to radon in drinking of water may have risk of getting
a) Cancer b) Typhoid
c) Blue baby syndrome d) Cholera

22. Remote sensing uses which of the following waves in its procedure.
 a) Sonar waves
 b) Electromagnetic waves
 c) Gamma ray
 d) None of these
23. What is called for the practice of regulating forest resources to meet the society and industry while preserving forest health?
 a) Environmental Protection
 b) Sustainable forest management
 c) forest policy
 d) Unsustainable forest management
24. Soil erosion is prevented by
 a) Deforestation
 b) Afforestation
 c) Overgrazing
 d) Removal of vegetation
25. Which one of the following states is the leading produce of iron ore?
 a) Chhattisgarh
 b) Jharkhand
 c) Karnataka
 d) Madhya Pradesh
26. Prevention and Control of Air Pollution Act in India was passed
 a) 1970
 b) 1975
 c) 1981
 d) 1990
27. An important NGO involved in Global Environmental Protection.
 a) UNICEF
 b) Green Peace
 c) WHO
 d) CPCB
28. Which one of the following is a source of sulphur dioxide in atmosphere?
 a) Volcanoes
 b) Thermal power station
 c) H_2SO_4 manufacturing
 d) All of these
29. The important non-metallic resource is
 a) Petroleum
 b) Bauxite
 c) Sidertile
 d) None of these
30. Which of the following reservoirs contain most water?
 a) Atmosphere
 b) biosphere
 c) Ground water
 d) Lakes and rivers
31. Which of the following is not the meaning of ecosystem?
 i) Unit where in all organisms live a healthy life
 j) A small unit that can be self sufficient
 k) Co-existence of diverse things by mutual adjustment
 l) A unit which includes all the organisms in a given area interacting with physical environment to form a natural unit of stability
32. The factors responsible for stable ecosystem are balance between
 a) Predators and prey
 b) Vegetation, herbivores and carnivores
 c) Competing species and biotic factors
 d) All of these
33. Which of it is not an example of ecosystem?
 a) Forest
 b) Desert
 c) Water
 d) Grassland
34. E.I.A can be expanded as
 a) Environment and Industrial Act
 b) Environment and Impact Activities
 c) Environmental Impact Assessment
 d) Environmentally Important Activity
35. Earth day is held every year on
 a) 5th June
 b) 23rd Nov
 c) 22nd April
 d) 26th Jan

36. Soil erosion removes surface soil which contains
a) Organic matter b) Plant nutrients c) Both a and b d) None of these
37. Mineral resources are
a) Renewable b) Non-renewable c) Equally distributed d) None of these
38. Fluoride though is an effective agent to prevent dental caries has a permissible limit of
a) 0.5 mg/lit of water b) 1.5 mg/lit of water
c) 5 mg/lit of water d) 1.0 mg/lit of water
39. Deforestation means
a) Maintenance of forest for recreation
b) Creating land for habitant of wild life
c) Conversion of forest land to agricultural land homes etc
d) Planting trees
40. Decrease of oxygen level in water mainly causes
a) Fluorosis b) Death of aquatic life
c) Water purification d) All of these
41. Select the correct statement about biodiversity.
a) The desert animals of Rajasthan and Gujrat have a very high of animal species as well as rare animals.
b) Large scale planting of biodiversity cotton has no adverse effect on biodiversity
c) Western Ghats have a very high degree of species richness and endemism
d) Conservation biodiversity is just a fad pursued by developing countries
42. Global warming can be controlled by
a) Reducing deforestation and cutting down the use of fossil fuel
b) Reducing afforestation and increasing the use of fossil fuel
c) Increasing the deforestation and increasing the growth of human population
d) Increasing deforestation and increasing the use of fossil fuels
43. Bhopal Gas Disaster is a kind of
a) Natural disaster b) Man-made disaster c) None of these d) Water leakage
44. The instrument which records earthquake wave is called
a) Climograph b) Seismograph c) Hyther graph d) None of these
45. Which of the following diseases appeared as public health concern in the last quarter of 20th century?
a) HIV b) Ebola virus c) Corona Virus d) All of these
46. The National Disaster Management Authority (NDMA) is headed by
a) President of India b) Prime minister of India
c) Governor of States d) Chief Minister of States
47. Cloud seeding is process of
a) Adding chemical material to cloud to obtain precipitation
b) To get more rainfall
c) It is artificial process to get rainfall during drought
d) All the above

62. How to remove leachate from landfill?
a) By gravity
b) By pumping from low points
c) Both a and b
d) None of these
63. Ground water is a source of trouble at which place
a) Plains
b) Slopes
c) Rivers
d) Lakes
64. The hot spots of biodiversity are characterized by
i) Low endemicity and low threat of extinction
j) Low endemicity and high threat of extinction
k) High endemicity and low threat of extinction
l) High intensity and threat of extinction
65. The world environment day is on
a) 5th June
b) 3rd October
c) 25th December
d) 11th July
66. Fossil fuels are converted into energy by
a) Burning
b) Cooling
c) Sublimation
d) Melting
67. Which place in India the tidal energy has been experimented?
a) Goa
b) Karnataka
c) Kerala
d) Tamil Nadu
68. India has the largest share of
a) Manganese
b) Mica
c) Copper
d) Diamond
69. Which of the following are major environmental issues involved in mining?
a) Air pollution from dust
b) Water pollution
c) Soil degradation
d) all of these
70. In an ecosystem the flow of energy is
a) Bidirectional
b) Cyclic
c) Unidirectional
d) Multidirectional
71. COD is
a) Chemical Oxygen Demand
b) Measure of dissolved impurities in water
c) Amount of oxygen required to oxidize organic and organic impurities
d) All the above
72. Which of the following compounds may be toxic to human beings?
a) Amino acids
b) Polychlorinated biphenyl
c) Vitamins
d) Proteins
73. Many rivers polluted due to
a) Heavy flux of sewage
b) Industrial effluents
c) Agricultural and domestic waste
d) All of these
74. The sound intensity is measured in
a) dB
b) NB
c) Horse power
d) MB
75. Air Pollution from automobiles can be controlled by fitting
a) Electrostatic precipitator
b) Wet Scrubber
c) Catalytic converter
d) All of these

76. Sound above what level are considered hazardous noise pollution
a) above 75 dB b) above 30 dB c) above 150 dB d) above 120 dB
77. Noise pollution at residential area
a) 45 dB b) 80 dB c) 55 dB d) 90 dB
78. Which of the following is not a man-made hazard?
a) Leakage of toxic waste b) Wars and civil strife
c) Drought d) Environmental pollution
79. The Bhopal gas tragedy was caused due to
a) Methyl isocyanate leakage b) Nitrous oxide leakage
c) Acid rain d) Radioactive poisoning
80. The Kyoto protocol is
a) The response to treat the climate change
b) To reduce the emission of green house gases
c) a and b
d) To give permission to emit green house gases
81. World Summit on sustainable development was held at
a) Johansberg in 2002 b) Rio de Janerio in 1992
c) Kyoto in 1994 d) Stockholm in 2000
82. Ozone layer thickness is measured in
a) PPM b) PPB c) Decibels d) Dobson units
83. Which of following related to GIS?
a) Euclidean space b) Ramanujan space c) Pythagorean space d) None of these
84. Remote sensing techniques make use of the properties of following radiation by the sensed objects
a) Electric waves b) Sound waves
c) Electromagnetic waves d) Wind waves
85. What is the fullform of NGOs?
a) Non Governmental Organization b) Null Governmental Organizations
c) Nice Governmental Organization d) None of these
86. Which one of the following has maximum genetic diversity in India?
a) Tea b) Teak c) Mango d) Wheat
87. The carbon "credit is permit" is permit representing the right to emit
a) One tone of Carbon Dioxide b) 10 tonnes of Carbon Dioxide
c) 5 tonnes of Carbon Dioxide d) 15 tonnes of Carbon Dioxide
88. What is the role of NGOs in natural resource management?
a) Creating awareness among the public on current environmental issues and solution
b) Being involved in the protection of human rights to a clean environment
c) Data generation on natural resources time line and history
d) Making profit from Government

89. The primary objective of ISO14001 is
- An internationally agreed standard sets out the requirements for an environmental manage system
 - It helps organizations to improve their environmental performance through more efficient use of resources
 - It helps organization for the reduction of waste gaining competitive advantage and trust of stakeholders
 - All the above
90. Which one of the following is not a renewable exhaustible natural resource?
- Aquatic animals
 - Wild life
 - Soil fertility
 - Minerals
91. Excess fluoride in drinking water is likely to cause
- Blue babies
 - Fluorosis
 - Fever
 - Cough and chill
92. All the following waste can be incinerated except
- Reactive Chemical Waste
 - Vaccine
 - Mutilated parts
 - Discarded drugs
93. Which Vaccination should be given to workers who deals with biomedical waste?
- Hbs Ag
 - Tetanus
 - Rabies
 - Both a and b
94. Nickel is released from
- Alloys
 - Display
 - Calculators
 - Circuit boards
95. Which of the following solid wastes describes the term 'Municipal Solid Waste'?
- Toxic
 - Hazardous
 - Non toxic
 - Non-hazardous
96. The blue baby syndrome is caused by the contamination of water due to
- Phosphates
 - Sulphur
 - Arsenic
 - Nitrates
97. The organic material of solid waste will decompose
- By the flow of water
 - By filtration
 - By drying
 - By the oxidation in presence of oxygen
98. The pH value of the acid rain water is
- 5.7
 - 7.0
 - 8.5
 - 7.5
99. The global warming may bring about the following changes in atmosphere
- Increase in temperature of earth
 - Drought
 - direct impact on human health
 - All of these
100. Which agency deals with the health effect that may occur from environmental exposure to toxic chemicals?
- Environmental Protection Agency
 - The Center for Disease Control and Prevention
 - The Agency for Toxic Substances and Disease Registry
 - The Nuclear Regulatory Commission
