Code No. 2598/CBCS/BL

FACULTY OF ENGINEERING

B. E. (Civil) (CBCS) V – Semester (Backlog) Examination, October 2020

Subject: Theory of Structures - I

Time: 2 Hours **Max. Marks :70**

PART –A

Note : Answer any Five Questions **(5x2=10 Marks)**

1. What is the difference between absolute stiffness and relative stiffness?
2. Write the slope deflection equation for a prismatic beam of flexural rigidity 'EI' and span 'l' if it's Right end sinks down by 'Δ'.
3. A propped cantilever of span 6m is loaded with udl of intensity 15 kN/m over entire span. Using slope deflection method, find the rotation of propped end.
4. What is rotational factor and displacement factor?
5. Find the displacement factor for the columns of frame shown in Fig. (1).

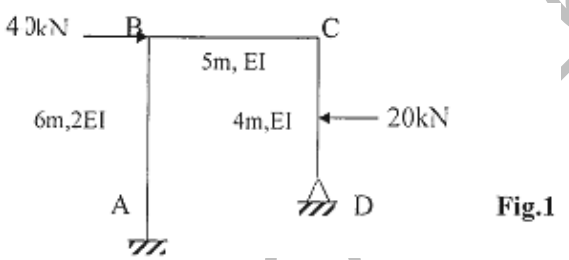

Fig.1

6. Write the horizontal shear equation for the frame shown in Fig. (1).
7. Using dummy load method find the deflection of free end of a cantilever beam of span 4m subjected to udl of intensity 20 kN/m over entire span.
8. State and explain Castigalino's theorems.
9. What is Eddy's theorem?
10. Find the Horizontal thrust of a three hinge parabolic arch if span 80 m and central rise 13 m subjected to udl of 30 kN/m over entire span.

PART-B

Note : Answer any Four Questions **(4x15 = 60 Marks)**

11. Using Slope Deflection Method analyse the beam shown in Fig.(2) if the support at 'B' sinks down by 150/EI. Draw BMD and SFD.

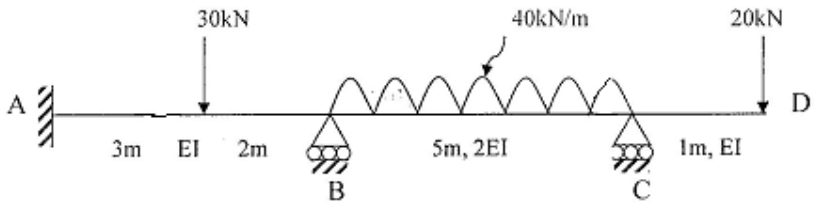

Fig.2

12. Analyze Frame shown in Fig.(3) by Moment Distribution Method and draw its BMD.

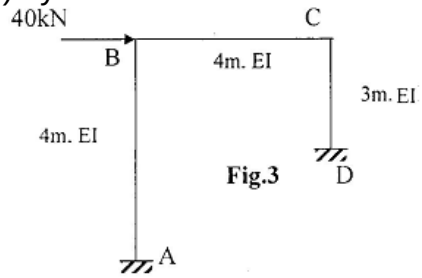

Fig.3

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13. Analyse the beam shown in Fig. (4) by Kani's method if the support at 'B' sinks down by 10 mm and that at 'C' sinks down by 7 mm. Take EI as 6000 kN-m^2 and draw its FD and BMD.

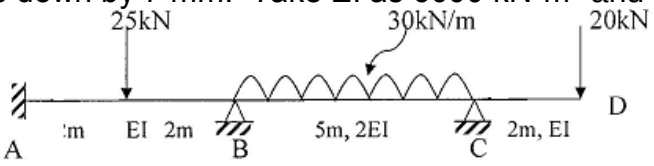

Fig.4

14. Analyse the frame shown in Fig. (5). By Kani's method and draw its BMD.

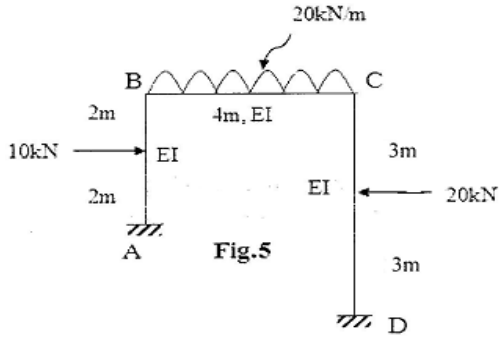

Fig.5

15. Using Strain Energy method find the vertical deflection at 'C' of a warren truss shown in Fig. (6)

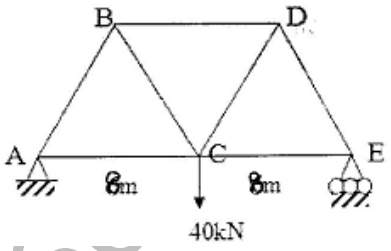

Fig.6

16. Find the forces in all the members of the truss shown in Fig.(7). Take AE as same for all members.

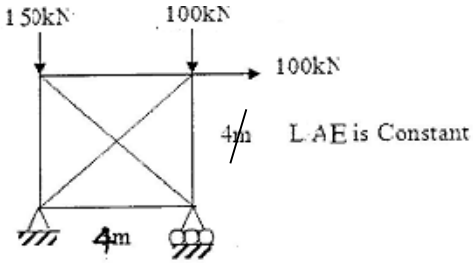

Fig.7

L AE is Constant

17. A parabolic arch of span 30 m central rise 6 m is loaded with a udl of 18 kN/m over its right half and a concentrated load of 25 kN at a distance of 12 m from left end. Find the Normal thrust and radial shear at a section 10 m from left end. Also draw the bending moment diagram for the arch.

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Code No. 2609/CBCS/BL

FACULTY OF ENGINEERING

B.E. (EEE/Inst.) V – Semester (CBCS)(Backlog) Examination, October 2020

Subject: Digital Signal Processing & Applications

Time: 2 Hours **Max. Marks :70**

PART –A

Note : Answer any Five Questions **(5x2=10 Marks)**

1. Define (a) Linearity (b) Stability.
2. Mention the properties of ROC in Z-transform.
3. Compute the DFT of a Sequence $(-1)^n$ for N = 4.
4. Find the IDFT of Y(k) = {1, 1, 0, 0}.
5. Distinguish between Analog and Digital Filter.
6. What is warping effect & pre-warping effect?
7. Compare Hamming and Kaiser Window.
8. What is Multirate Signal Processing?
9. What are the advantages of ADSP over Microprocessor?
10. What is the basic difference between P-DSP & Microprocessor?

PART-B

Note : Answer any Fou Questions **(4x15 = 60 Marks)**

11. (a) Find the natural response of the system described by difference equation.
    Y(n) + 2y(n-1) +y(n-2) = x(n) + x(n-1) with initial condition y(-1) = y(-2) = 1.

    (b) Determine if the following system is Time variant or time invariant
    a. y(n) = x(n) + x(n-1) b. y(n) = x(-n)

12. (a) State and Prove Symmetry properties of DFT.
    (b) Calculate the time sequence x(n) for give DFT components {2, 1+j, 0, 1-j}

13. (a) What is FFT and why it is needed. What are the differences and similarities between DIF and DIT algorithms? Distinguish between DTFT, DFT and FFT.
    (b) Find the DFT of a sequence x(n) = (1, 2, 3, 4, 4, 3, 2, 1} using FFT DIT algorithm.

14. (a) Obtain the cascade and parallel form realization for the system.
    Y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2).
    (b) Write the design procedure of Low pass Butterworth Filter.

15. (a) Write short notes on Architecture of TMS320C5X. Write about the Bus structure, CALU, AR and INDEX registers in detail.
    (b) Write short notes on Programmable DSP.

16. (a) Find the Inverse Z-Transform of $X(Z) = \frac{(Z + 0.2)}{(Z + 0.5)(Z - 1)}, Z > 1$
    (b) For the analog Transfer function H(s) = 1/(s + 1) (s + 2). Determine H(z) using Impulse invariance method. Assume T= 1sec.

17. (a) Design a Chebyshev Filter with a maximum pass-band attenuation of 2.5 dB at Ωp = 20rad/sec and the stop-band attenuation of 30dB at Ωs = 50rad/sec.
    (b) Design one-stage and two-stage interpolators to meet the following specification I = 20.
    (a) Pass band: 0 ≤ F ≤ 90. (b) Transition band: 90 ≤ F ≤ 100.
    (c) Input sampling: 10,000Hz. (d) Ripple: $\delta_p = 10^{-2}$ $\delta_s = 10^{-3}$.

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Code. No. 2623/CBCS/BL

FACULTY OF ENGINEERING

B.E. V-Semester (CBCS) (ECE) (Backlog) Examination, October 2020

Subject : Analog Communications

Time: 2 Hours **Max. Marks :70**

PART –A

Note : Answer any Five Questions **(5x2=10 Marks)**

1. A 400W carrier is modulated to a depth of 75 %. Calculate the total power in the modulated wave?
2. What are the Advantages of SSB systems?
3. Define frequency deviation
4. Compare FM and PM techniques
5. What is the need of Pulse modulation?
6. Compare PAM, PPM, PWM
7. Distinguish between high level and low-level AM transmitters
8. Define Fidelity?
9. What are the different sources of noise?
10. Why pre-emphasis and de-emphasis is required in FM only why not in AM?

PART-B

Note : Answer any Four Questions **(4 x 15 = 60 Marks)**

11. a) Explain the working of square law modulator for generation of DSB-SC wave
    b) Derive the expression for the total transmitter power in AM wave also obtain its efficiency?

12. a) Define quadrature null effect explain how to overcome it with a neat Block diagram
    b) What is Hillbert transform? State and prove its properties

13. a) With a neat sketch explain the operation of Balanced slope detector used for FM demodulation
    b) Discuss the Generation of NBFM signal and Bring out the similarities and differences between NBFM and AM

14. a) Explain generation and detection of PWM signal
    b) Explain the detection of PPM signal with near sketch

15. a) Draw the block diagram of Tuned Radio frequency receiver explain its operation
    b) When a super heterodyne receiver is tuned to 555kHz, and its local oscillator provides the mixer with an input at 1010 kHz. What is the image frequency? The antenna of this receiver is connected to the mixer via tuned circuit whose loaded Q is 40. What will be the rejection Ratio for the calculated image frequency?

16. a) Explain the need for pre-Emphasis and De-Emphasis
    b) What is figure of merit? Calculate the figure of merit for AM

17. Write short notes on
    a) Selectivity and sensitivity b) White noise and thermal noise
    c) Mixer

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Code No. 2629/CBCS

FACULTY OF ENGINEERING

B. E. (Mechanical) (CBCS) V – Semester (Backlog) Examination, October 2020

Subject: Manufacturing Processes

Time: 2 Hours **Max. Marks :70**

PART –A

Note : Answer any Five Questions **(5x2=10 Marks)**

1. What do you know about “Directional solidification”?
2. What are the types and advantages of gas welding flames?
3. Give applications and limitations of centrifugal casting process.
4. Differentiate between soldering and brazing.
5. Briefly explain the principle of ultrasonic welding process.
6. What is the electrode material used in resistance welding and why?
7. Distinguish between spot welding and seam welding.
8. Differentiate between forward and backward extrusion. Which gives less extrusion force and why?
9. Explain briefly about and deep drawing process.
10. Enlist various types of pattern materials used in casting process.

PART-B

Note : Answer any Four Questions **(4 x 15 = 60 Marks)**

11. (a) What are different types of gates used in sand moulidng? Explain about them with relative merits, demerits and applications.
    (b) What are the differences between cold chamber and hot chamber process? Explain about any one of them in brief with a neat diagram.
12. (a) Name a few components which can be manufactured by thermoforming process. Explain how the process is carried out.
    (b) What are the advantages of solid state welding processes over fusion welding processes? Explain ultrasonic welding process with a neat sketch.
13. (a) Explain plasma arc welding process with a neat sketch. Describe how it is different from Tungsten inert gas welding.
    (b) What is the principle of resistance welding? Explain the spot welding process along with its applications.
14. (a) State and explain various welding defects, their causes and remedies.
    (b) What are different types of cold extrusion processes? Explain about any one of them.
15. (a) What are the advantages of high rate energy forming processes over conventional processes? Explain about electro hydraulic forming with a neat sketch.
    (b) Explain rolling defects with neat sketches.
16. (a) Explain various properties of moulding sand and give-its ingredients details.
    (b) Discuss the types of pattern allowances provided on patterns.
17. (a) Explain with neat sketch the friction stir welding process.
    (b) Differentiate between stretch forming and explosive forming.

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Code No.2634/CBCS

FACULTY OF ENGINEERING

B. E. (Production) (CBCS) V–Semester (Main & Backlog) Examination,

October 2020

Subject: Metal Forming Technology

Time: 2 Hours **Max. Marks :70**

PART –A

Note : Answer any Five Questions **(5x2=10 Marks)**

1. What is work hardening of Metals? Explain.
2. Write the advantages and applications of cold working.
3. What is meant by *bend radius*? Explain briefly.
4. Sketch and label the parts of a compound die.
5. What types of stresses are included in the bent sheet metal?
6. Differentiate between forward and backward extrusion process.
7. Explain the principle of Forging with a sketch.
8. Enlist the various forging defects.
9. What are different process variables in rolling process?
10. Explain briefly about lagging and leading zones in rolling process.

PART-B

Note : Answer any Four Questions **(4 x 15 = 60 Marks)**

11. (a) Explain the phenomenon of plastic deformation of mild steel with a sketch.
    (b) Discuss the plane stress and plane strain conditions.

12. (a) Give a detailed classification of presses used for sheet metal works.
    (b) Describe the stretch forming operation with the help of net sketch.

13. (a) Sketch the cross section of a drawing die and explain various features of it.
    (b) Describe the process of wire drawing with a neat sketch.

14. (a) What are various defects occurred during extrusion process?
    (b) What is upset forging? Explain with a neat sketch.

15. (a) How forged components are better than cast components? Explain clearly.
    (b) With the help of a neat sketch explain the principle of flow forming process.

16. (a) Describe the principle of cluster rolling mills with the help of a net sketch.
    (b) What do you understand by *roll speeds* and *roll gaps*? Mention their significance in rolling operations.

17. Write short notes on any TWO of the following:
    (a) Recrystallization temperature.
    (b) Isothermal Forging.
    (c) Roll defects.

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Code No. 2636/CBCS/BL

FACULTY OF ENGINEERING

B. E. (Mech.) V – Sem. (CBCS)(Main &Backlog) Examination, October 2020

Subject: Automotive Diesel Engines

Time: 2 Hours **Max. Marks: 70**

PART –A

Note : Answer any Five Questions **(5x2=10 Marks)**

1. Compare 2 stroke and 4 stroke engines?
2. Define mean effective pressure and compression ratio.
3. Define self ignition temperature and what is its value for diesel fuel?
4. Define maximum speed and all speed governor.
5. Define the terms Swirl and Squish.
6. What are the applications of pintle nozzle?
7. What is delay period? How to measure it?
8. Draw a neat sketch of turbo charger.
9. What are the pollution norms used in India?
10. Explain the parameters to be considered for reducing pollutants from an automobile.

PART-B

Note : Answer any Four Questions **(4 x 15 = 60 Marks)**

11. Why the efficiency of actual cycles is lower than that of air standard cycles? List the various losses in actual cycles.
12. What is the purpose of governor in CI engine? With a neat sketch explain the working principle of a mechanical governor.
13. Describe with suitable sketches, the various stages of combustion in a diesel engine.
14. Explain the working principle of super charging and turbo charging with suitable neat sketches.
15. What are the different methods to analyze the exhaust gasses and explain each of them?
16. Derive an expression for air standard efficiency of diesel cycle and also derive an expression for mean effective pressure.
17. a) What is PTFI pressure wave system? Explain in details.

    b) What are the design considerations for good combustion chambers?

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Code No. 2640/CBCS/BL

FACULTY OF ENGINEERING

B. E. (CSE) (CBCS) V – Semester (Backlog) Examination, October 2020

Subject: Data Communications

Time: 2 Hours **Max. Marks :70**

PART –A

Note : Answer any Five Questions **(5x2=10 Marks)**

1. What are the major components of Data communication system?
2. Describe attenuation.
3. Write about Frame relay.
4. Define Line coding.
5. Distinguish between Datagram and Virtual circuit operation.
6. Define single bit errors and burst errors.
7. Explain the concept of Parity check and CRC in error detection.
8. What are the functions of physical layer?
9. What is CSMA/CD?
10. Describe the merits and demerits of different LAN technologies.

PART-B

Note : Answer any Four Questions **(4x15 = 60 Marks)**

11. (a) Explain in detail about ATM protocol architecture.
    (b) Explain about HEC operation at receiver.

12. (a) Describe the formula of shanon for channel capacity.
    (b) For the bit stream 11001010 sketches the wave form of any three digital encoding formats.

13. (a) Write short notes on stop and wait ARQ.
    (b) Discuss briefly about HDLC Data link control protocol.

14. (a) What are IEEE standards? Explain any one.
    (b) Discuss MAC Sub layer

15. (a) What are the different types of Ethernet? Describe the characteristics for one of the Ethernet types.
    (b) Elaborate spanning Tree Bridge

16. (a) Explain Bluetooth architecture.
    (b) Briefly describe ATM call format.

17. (a) Distinguish Synchronous & Asynchronous transmission.
    (b) Write short notes on error correction techniques.

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Code No. 2649 / CBCS

FACULTY OF ENGINEERING

B.E. V Semester (CBCS) (Backlog) Examination, October 2020

Subject: DATABASE SYSTEMS

Time: 2 Hours **Max. Marks: 70**

PART –A

Note : Answer any Five Questions **(5x2=10 Marks)**

1. Who are the various database users?
2. Write about Views.
3. Draw the E-R diagram for banking application.
4. Explain Set Operations with example.
5. What is Functional Dependency?
6. Describe about 'Thomas' write rule.
7. Explain Bitmap indices.
8. Write about Recursive queries.
9. Write ARIES recovery algorithm.
10. Brief about Deadlock prevention schemes.

PART-B

Note : Answer any Four Questions **(4x15 = 60 Marks)**

11. (a) Explain DBMS architecture in detail with diagram.
    (b) Discuss various applications of databases.

12. (a) Discuss fundamental relational algebra operations with examples.
    (b) Explain Aggregate Functions with example. (consider EMP table as default)

13. Explain various **Normal Forms** with example.

14. (a) Define hashing. Explain different hashing techniques with an example.
    (b) What is Serializability? Explain with example.

15. (a) Explain Log Based Recovery Protocol in detail.
    (b) Explain about Multiple Granularity.

16. What is B+ Tree? Construct **B-tree** and **B+ tree** for the following set of values
    Kathv, James, Alex, Marry, Rose

17. Write Short Notes on:
    (a) ACID properties.
    (b) Buffer Management.
    (c) Differentiate FUNCTIONS and PROCEDURES in databases.

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Code No: 2083

FACULTY OF ENGINEERING

B.E. 3/4 (Civil) I-Semester Examination, October 2020

Subject : Fluid Mechanics – II

Time: 2 Hours **Max. Marks :70**

PART –A

Note : Answer any Five Questions **(5x2=10 Marks)**

1. Classify the types of flow in open channels
2. Define Froude number and write its significance in open channel flow
3. What is the difference between form drag and skin friction drag
4. What do you understand by distorted model
5. Define specific speed of a pump
6. Define critical depth
7. What is draw down curve
8. Define Bluff body
9. Define kinematic similarity
10. What is meant by impact of jet on vanes

PART-B

Note : Answer any Four Questions **(4 x 15 = 60 Marks)**

11 a) Define specific energy curve and explain all its salient features
   b) A rectangular channel is 6m wide and 1.5M deep. If the bed of the channel is paid at a slope of 1 in 5000; Calculate the velocity and discharge its cheny's constant C is 50

12 a) Derive the dynamic equation of gradually varied flow
   b) Hydraulic jump is taking place in a horizontal rectangular channel. Froude number before the jump is 10 and energy loss during jump is 4M. Calculate
   a) Depth before jump and b) Depth after the jump.

13 a) What is water hammer. Dervive an expressions for pressure rise due to sudden closure of valve and pipe elastic
   b) A flate plate 1.5M x 1.5M moves at 50 kMph in stationary air of density 1.2kg/m3. If the Co-efficient of drag and lift are 0.3 and 0.7 respectively. Determine
   a) Lift force b) Drag force and c) Resultant force.

14 a) Explain Froude model law giving examples
   b) The pressure difference (Δ P) in a pipe of diameter (D) and length (L) due to viscous flow depends on the velocing (V), Viscosity (μ) and density (f). using Buckingham theorem. Obtain an expression for Δ P.

15 a) Describe the principle and working of a pelton wheel turbine
   b) A centrifugal pump is to discharge 0.12 m^3/s at a speed of 1400 rpm against a head of 25m. The impeller diameter is 25cm and its width at outlet is 5cm and manometric efficiency is 70%. Determine the vane angle at the outlet periphery of the impeller

16 a) Distinguish between laminar boundary layer and turbulent boundary layer
   b) Define surge and classify surges. And also state the importance of surge analysis.

17. Write short notes on two of the following
   a) Momentum Correction factor
   b) Characteristic Causes of Turbines
   c) Boundary layer separation

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Code No. 2089/BL

FACULTY OF ENGINEERING

B.E 3/4 (EEE) I – Semester (Backlog) Examination, October 2020

Subject: Electrical Machinery – II

Time : 2 Hours **Max. Marks: 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 Explain Delta-Delta connection & phase diagram for a 3-ϕ transformer?
2 Mention the applications of Auto Transformer?
3 Write short notes on 'Measurement of insulation resistance'?
4 What happens if the impedance drops of the two transformers connected in parallel are not equal?
5 Define slip? A 3-ϕ induction motor is wound for 4-poles and is supplied from 50Hz System. Calculate Rotor speed when slip is 4%?
6 Derive the condition for maximum starting torque of a 3- ϕ induction motor?
7 List the starting methods for 3-ϕ induction motor?
8 What are the drawbacks in open loop V/f control of 3- ϕ induction motor?
9 What do you understand by voltage unbalanced in of 3- ϕ induction motor?
10 Draw the equivalent circuit of Double cage induction motor?

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 What is an Auto Transformer? Explain it's Operation, Advantages, Disadvantages & Applications? Also compare with two-winding transformer?

12 (a) Describe the Routine and Special Tests to be performed on a 3-ϕ Transformer?
(b) Two Transformers are required for a Scott connection operating from a 440v, 3-ϕ supply for supplying two 1-ϕ furnaces at 200v on the two phase side. If the total output is 150kVA, Calculate the secondary to primary turn ratio and winding currents of each transformer?

13 (a) Explain the Torque – Slip characteristics of a 3- ϕ induction motor?
(b) A 3-ϕ, 400/200V, star-star connected wound rotor induction motor has 0.06 ohms Rotor resistance and 0.3 ohms standstill reactance per phase. Find the additional resistance required in the rotor circuit to make the Starting torque equal to maximum torque of the rotor?

14 Explain the following Speed Control Methods for 3- ϕ induction motor:
(a)Tandem Method
(b) Pole changing Method
(c) Rotor Resistance Method
(d) By injecting emf in the rotor circuit Method

15 (a) Discuss the operation of a 3- ϕ transformer when
(i) Unbalanced voltage is applied (ii) Unbalanced load on it.
(b) How do we obtain the equivalent circuit of a 3- ϕ induction motor during unbalanced operation?

16 Explain the following:
(a) Induction Generator
(b) Crawling & Cogging
(c) Difference between Squirrel cage and wound rotor of 3- ϕ induction motor.

17 Explain the following:
(a) On load Tap changer
(b) Testing of Transformer for calculating no load current & insulation resistance.

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Code No. 2095/BL

FACULTY OF ENGINEERING

B.E. 3/4 (Inst.) I - Semester (Backlog) Examination, October 2020

Subject : Signal and Systems

Time : 2 Hours **Max. Marks: 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 Determine Linearity and causality of the following systems

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

b) $y(t) = at^2x(t) + btx(t-4)$

2 Determine the energy of the signal $x(t) = 7\cos\left(20\,t + \frac{\pi}{2}\right)$.

3 Give two examples of complete sets.

4 Give necessary and sufficient condition for existence for Fourier series.

5 Prove Time shifting property of Fourier Transform.

6 Determine the inverse Fourier transform of $X(w) = \frac{2A}{w}\sin w\lambda/2$.

7 State any two properties of Laplace transform.

8 Find Laplace transform of signal $x(t) = e^{-2t}\,u(t) + e^{3t}\,u(t)$.

9 Find Z-transform of $x(n) = an\,u(n)$.

10 Define Zero Order Hold.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 a) Find the convolution of $x_1(n)$ and $x_2(n)$ given as
$x_1(n) = \{1, 2, 3, 0, 5\}$, $x_2(n) = \{1, 1, 1\}$

b) State and prove properties of LTI systems.

12 a) State and Prove symmetry properties of Fourier series.

b) Find exponential Fourier series coefficient of $x(t) = 3\cos\left(\frac{\pi\,t}{2} + \frac{\pi}{4}\right)$.

13 a) Prove the Time domain differentiation and integration properties of Fourier Transform.

b) Find Fourier transform of a sigum function given as

$$\text{sgn}(t) = \begin{cases} 1, t > 0 \\ -1, t < 0 \end{cases}$$

14 a) State and prove final value theorem of Laplace transform.

b) Determine the inverse Laplace Transform of

$$G(s) = \frac{s}{(s+3)(s^2 + 4s + 5)}$$

..2

15 a) Find the Z-transform of and ROC of the following equations

i) $h(n) = \left(\frac{1}{2}\right)^n u(n) + \left(\frac{1}{3}\right)^n u(-n)$

ii) h(n) = {5, 3, -2, 0, 4, -3}

b) Find the causal signal x(n) if its Z-transform is given by

$$X(z) = \frac{z}{2z^2 - 3z + 1}, |z| > 1$$

16 Consider a stable LTI system characterized by the differential equation. $\frac{dy(t)}{dt} + 2y(t) = x(t)$. Find its impulse response when the initial conditions are

$y(0+) = 1, y'(0+) = \left(\frac{dy(t)}{dt} / t = 0\right) = 2$.

17 Write short notes on :

a) Sampling Theorem

b) Parseval's theorem for aperiodic signal

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Code. No. 2102/O/BL

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I-Semester (Backlog) Examination, October 2020

Subject: Digital Integrated Circuits and Applications

Time: 2 Hours **Max. Marks :75**

PART –A

Note : Answer any Seven Questions **(7x3=21 Marks)**

1. What are the advantages of digital ICs over Analog ICs?
2. Compare DTL and TTL logic families?
3. Briefly write about Totem Pole TTL logic family?
4. Draw circuit of CMOS inverter?
5. Compare Serial binary adder and carry look – ahead adder?
6. Draw circuit of 1-bit digital comparator?
7. List the applications of shift register?
8. Explain working principle of Master-Slave JK-flip flop?
9. Write about Flash Memory?
10. What is a ROM. What are the different types of ROMS?

PART-B

Note : Answer any Three Questions **(3 x 18 = 54 Marks)**

11. a) Explain the working of TTL NOR gate?
    b) Write about Tri-State logic?

12. Explain working of CMOS Transmission gate with circuit diagram, what are its applications?

13. a) Design a binary Full Subtractor using 4*1 multiplexers?
    b) Write about parity Bit generator system?

14 Design a divide by 10 up-down ripple counter using JK flip flops. Draw the waveforms?

15. a) What are PLDs – explain briefly?
    b) Explain PLA with its architecture?

16. Explain the working of 40bit Carry look ahead adder with circuit diagram?

17. Write short notes on
    a) Expanding word size and capacity in memory
    b) IC characteristics
    c) Dynamic MOS inverter

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Code No. 2097/BL

FACULTY OF ENGINEERING
B.E. 3/4 (ECE) I - Semester (Backlog) Examination, October 2020

Subject : Computer Organization and Architecture

Time : 2 hours **Max. Marks : 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 What is normalization and alignment in floating point arithmetic?
2 Draw the block diagram of a 4-bit binary incrementer.
3 Write the instruction formats for memory reference and register reference instructions.
4 What is a pipeline hazard?
5 What are the different addressing modes of a basic computer?
6 What is meant by 'locality of reference' and how does it help in faster execution of the programs?
7 Differentiate between synchronous and asynchronous data transfer.
8 Why does DMA have priority over CPU when both request a memory transfer?
9 Explain virtual address and physical address.
10 What is superscalar architecture?

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 a) Explain (with the help of suitable examples) IEEE standard for floating-point numbers.
b) Using booth's multiplication algorithm, multiply two signed numbers -9 and -13 showing all the steps.

12 a) Explain the various phases of an instruction cycle.
b) Draw the logic diagram of a 4-bit adder-subtractor and explain with the help of a truth table.

13 a) What is the purpose of micro program sequencer? Explain with a block diagram, how the sequencer presents address to control memory.
b) Discuss SIMD processor organization.

14 a) Draw the block diagram of an Asynchronous communication interface and explain its operation.
b) Draw a flow chart for a six stage CPU instruction pipeline and explain.

15 Explain the various elements of cache design and various mapping techniques used with cache.

16 a) How many 128 x 8 memory chips are needed to provide a memory capacity of 4096 x 16? Give the circuit diagram of the memory using the memory chips.
b) Explain how programmed I/O and interrupt initiated I/O operations are carried out.

17 Write any Two of the following :
a) Handshaking control of asynchronous data transfer
b) Instruction Level Parallelism
c) Stack organized instruction formats

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Code No: 2105/BL

FACULTY OF ENGINEERING

B.E. 3/4 (M/P/AE) I – Semester (Backlog) Examination, October 2020

Subject: Dynamics of Machines

Time: 2 Hours **Max. Marks:75**

PART – A

Note: Answer any seven questions. (7x3 = 21 Marks)

1. What is meant by angle of heel in two-wheeler while taking a turn?
2. Define the following: Piston effort, Crank effort.
3. State the functions of a governor and a flywheel.
4. Differentiate between static and dynamic balancing.
5. Explain the direct and reverse crank method. Where it is used?
6. Define magnification factor and transmissibility.
7. Find the natural frequency of a cantilever beam if a point load 'W' acts at the end of beam and 'Δ' is static deflection at the end.
8. Define terms damping coefficient, and damping factor.
9. Explain the difference between Rayleigh's method and Dunkerley's method for transverse vibrations of a shaft.
10. Draw the controlling force diagram for spring controlled governor when it is stable, unstable and isochronous.

PART – B

Note: Answer any three questions. (3x18 = 54 Marks)

11. The rotor of a marine turbine has a moment of inertia of 750 kg-m^2 and rotates at 3000rpm clockwise when viewed from aft. If the ship pitches with angular simple harmonic motion having a periodic time of 16 seconds and an amplitude of 0.1 radian, find the (i) find the maximum angular velocity of the rotor axis; (i) maximum value of the gyroscopic couple; (iii) gyroscopic effect as the bow dips.

12. In a Hartnell governpr, the lengths of the ball and the sleeve arms are equal. The extreme radii of rotation of the balls are 60 mm and 80 mm and the corresponding speeds are 160 rpm and 175 rpm. Each ball has a mass of 2 kg. Find the spring stiffness and the initial compression of the central spring.

13. The torque delivered by a two stroke engine is represented by
T = (1200+1400 sin θ +210 sin 2θ +21 sin 3θ) N-m where θ is the angle turned by the crank from the inner-dead centre. The engine speed is 210 rpm. Determine the power of the engine and the minimum mass of the flywheel if its radius of gyration is 800 mm and the maximum fluctuation of speed is to be $\pm 1.5\%$ of the mean.

14. The three cranks of a three cylinder locomotive are all on the same axle and are set at 120^o. The pitch of the cylinders is 1m and and the stroke of each piston is 0.6 m. The reciprocating masses are 300kg for inside cylinder and 260kg for each outside cylinder and the planes of rotation of the balance masses are 0.8 m from the inside crank. If 40% of the reciprocating masses are to be balanced, find: (a) The magnitude and the position of the balancing masses required at a radius of 0.6 m; and
(b) The hammer blow per wheel when the axle makes 6 r.p.s.

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15. The following data relates to a shaft held in long bearings. Length of the shaft = 1.2m; Diameter of the shaft = 14 m; Mass of a rotor at midpoint = 16 kg; Eccentricity of centre of mass of rotor from centre of rotor = 0.4 mm; Modulus of elasticity of shaft material =200 GN/n^2; Permissible stress in shaft material = 70 x 10^6 N/m^2. Determine the critical speed of the shaft and the range of speed over which it is unsafe to run the shaft. Assume the shaft to be mass less.

16. In a single-degree damped vibrating system, a suspended mass of 8 kg makes 30 oscillations in 18 seconds. The amplitude decreases to 0.25 of the initial value after 5 oscillations. Determine the
    (i) stiffness of the spring
    (ii) logarithmic decrement
    (iii) Damping factor
    (iv) damping coefficient.['

17. Write a short notes on the following:
    i) Stability of an Automobile
    ii) Engine force analysis
    iii) Balancing of Radial engines
    iv) Torsionally equivalent shaft

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Code No: 2117/BL

FACULTY OF ENGINEERING
B.E. 3/4 (CSE) I Semester (Backlog) Examination, October 2020

Subject: Operating Systems

Time: 2 hours **Max. Marks: 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 Describe the typical elements of process control block?
2 List the various scheduling criteria for CPU scheduling?
3 Define Compaction?
4 Explain any four common file attributes?
5 Describe the representation of a resource-allocation graph?
6 Define the terms – object, domain, access right?
7 What is beladay's anamoly?
8 Define the terms with respect to disk I/O - seek time, latency time?
9 What is the purpose of command Interpreter?
10 What are the design principles of LINUX?

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 Calculate the average waiting time and average turnaround time for the following data using the policy :
a) Pre-emptive SJF
b) Non-pre-emptive
c) FCFS

Process	Burst Time	Arrival Time
P1	25	0
P2	10	2
P3	5	4
P4	30	6

12 For the given page reference string, calculate the total number of page faults caused by the following page replacement algorithms for given frame size = 3. Initially all frames are empty. i) FIFO ii) LRU iii) Optimal page replacement
Page Reference string : 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 5, 1, 3, 2.

13 a) What are the three criteria a critical section problem solution needs to satisfy?
b) Write and explain Readers – Writers problem solution.

14 Explain in detail the different levels of RAID with neat diagrams.

15 a) Explain Banker's algorithm for deadlock avoidance with an example?
b) What are the main differences between capability lists and access lists?

16 a) Explain environmental subsystem in WINDOWS-XP
b) Compare how process management is done in Linux and Windows

17 Write a short note on the following
a) DMA.
b) File sharing
c) Thrashing

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Code No. 2122/BL

FACULTY OF ENGINEERING

B. E. 3/4 (IT) I – Semester (Backlog) Examination, October 2020

Subject: Operating Systems

Time: 2 Hours **Max. Marks :75**

PART –A

Note : Answer any Seven Questions **(7x3=21 Marks)**

1. What is the purpose of Operating System?
2. Differentiate preemptive and non-preemptive scheduling algorithms.
3. State the necessary conditions for the deadlock to occur?
4. What is Resource Allocation Graph? Give example.
5. Define semaphore and its operations.
6. Differentiate between Internal and External fragmentation.
7. What is Thrashing? Give reasons of thrashing.
8. What is RAID? What are its advantages?
9. What are the different types of security attacks?
10. Differentiate between access control list & capability list.

PART-B

Note : Answer any Three Questions **(3 x 18 = 54 Marks)**

11. (a) What is an Operating system? List the services that an Operating System provides to its users.
    (b) What is a system call? Explain types of system calls.

12. Compute for each average turn around time and average waiting time using FCFS, SJF (preemptive), Priority (non-preemptive), Round robin (Time slice = 2ms) Process scheduling method. Draw the Gantt chart for each scheduling Algorithm.

Process	Burst Time	Priority	Arrival Time
P_1	10	3	0
P_2	3	2	2
P_3	1	1(H)	1
P_4	5	4(L)	1
P_5	7	2	1

13. (a) Explain the paging technique with a suitable example.
    (b) What is Dining-philosophers problem using semaphores?

14. (a) Consider the following Page-reference string 1,2,3,4,2,1,5,6,2, 1,2,3,7,6,3,2,1,2,3,6 calculate the number of Page Fault that would occur for the following algorithms assuming Frame size as 4.
    (i) FIFO, (ii) LRV, (iii) OPTIMAL

    (b) Discuss about various File Allocation Methods.

15. (a) Write about the implementation of the Access Matrix.
    (b) Write Bankers Algorithm for Deadlock Avoidance.

16. (a) Explain the various security measures to protect files from unauthorized access.
    (b) Write about the approaches used to provide user authentication

17. Write short notes on any Two of the following:
    (a) Monitors (b) Segmentation. (c) Semaphores.

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