Code No.811/2795/CBCS

FACULTY OF ENGINEERING
B.E. (Civil) VIII-Semester (CBCS) (Main) Examination, September 2020

Subject : PE842CE: Principles of Green Building Practices

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

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1 What are the typical features of Green Buildings?
2 What are the benefits of a green building?
3 Define Solar Heat Gain co-efficient?
4 List any four criteria used in the category of "Water Conservation and Efficiency" for Green rating of building projects.
5 Define the term life cycle energy of a building and its component energies.
6 List any four criteria used in the category of "Energy Efficiency" for Green rating of building projects.
7 What are local materials in the context of Green Buildings? Why is it recommended to be used in green buildings?
8 What are the different types of waste products from a building that needs proper planning to be disposed?
9 List at least four sub-criteria in the category of Indoor Environmental Quality in Green Buildings.
10 What is the intent of using low VOC materials, paints and adhesives in green buildings?

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11 a) Describe in detail the key features of a Green Buildings.
b) What are the Green Buildings Rating systems available in India? Describe how these ratings have come about and instituted.

12 What is Urban Heat Island effect? What are the measures that can be adopted in a Green Building to reduce this effect?

13 Discuss the measures used for building envelop design in order to contribute to energy efficiency in buildings.

14 Write short notes on the following measures of using sustainable buildings materials in Green Buildings Projects.
a. Use of rapidly renewable materials and certified wood.
b. Use of buildings materials with recycled content.

15 Write short notes on ANY TWO of the following in relation to Indoor Environmental Quality (IEQ) in green building practices:
a. Building flush out
b. Air Ventilation
c. CO_2 monitoring
d. Low VOC compounds

16 Explain in detail the strategies and methods used for reducing the daily water consumption in a Green Building.

17 Describe the approaches for reducing the environmental impact due to waster disposal due to construction and post-occupancy activities?

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OU - 1607 OU - 1607

Code No.812/2796/CBCS

FACULTY OF ENGINEERING

B.E. (Civil) VIII-Semester (CBCS) (Main) Examination, September 2020

Subject : Advanced Reinforced Concrete Design

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

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1 What is design principles of curved beams?
2 Give IS specifications required for the design of deep beams.
3 Define portal frame?
4 How do you analyze portal frame with hinge and without hinge.
5 What is substitute frame method explain
6 Define distribution factors and stiffness factors.
7 Give any two general notes on flat slabs.
8 Define opening in flat slabs.
9 What is raft foundation?
10 Explain the term column Head.

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11 A circular girder of a water tank has a mean diameter of 12m, and it is supported on ten symmetrically placed columns. The uniformly distributed load on the girder is 280 kN/m. Design the critical section of the girder using M25 grade concrete and fe500 grade steel. Sketch the reinforcement details.
K1 = 0.0054 K2=0.0023 K3=0.0003 w=7degrees 30 sec.

12 A single span deep beam has overall depth of 4m and an effective span of 6m. the width of the beam is 480mm. The beam supports a uniformly distributed live load on 300kN/m, over the entire span. Using M25 grade concrete and fe 500 grade steel, design the suitable reinforcements for the beam and sketch the reinforcement details.

13 a) A hall 60m long and 12m wide has to be covered by a continuous R.C.C slab over portal frames spaced at 4m interval. The height of the hall is 6m. Design the slab. Adopt M30 grade concrete and fe500 grade steel. Sketch the reinforcement details.
b) Write the stepwise procedure for the design of substitute frame.

14 Design a interior panel of a flat slab carrying a super imposed load of 2.75 kN/m^2. The weight of the floor finish on the slab may be taken as 1.75 kN/m^2. The panel is supported on 350 mm diameter circular columns. Size of panel is 6m x 8m.
use M 25 grade contrete and Fe 500 grade steel.

15 Discuss in detail the IS codal provisions for the design of flat slabs. And also discuss the design aspects for flexure and shear in flat slabs.

16 Design a pile foundation for a column load of 140 kN. Length of the pile is 8.5 m. Use M40 grade concrete and Fe 500 grade steel. Draw a neat sketch of reinforcement details.

17 Design a mat foundation for 10 columns, arranged in two rows, spaced at 5 meters c/c in the longitudinal direction and 5 metres in the transverse direction.
The internal columns carry 1600 kN each and end columns carry 1200 kN.
The bearing capacity of the soil is 150 kN/sq.m.

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OU-1607 OU - 1607

Code No. 813/2797/CBCS

FACULTY OF ENGINEERING
B.E. (Civil) VIII-Semester (CBCS) (Main) Examination, September 2020

Subject : Traffic Engg. & Infrastructure Design (E-V)

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

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1 What is the value of SSD, if the design speed is 100 km/hr. perception time of driver is 2.5 sec and co-efficient of longitudinal friction is 0.35?
2 What are the vehicle parameters useful for designing of geometric elements of highways?
3 What is the difference between ISD and SSD?
4 Write the maximum permissible values of super elevation applicable for
i) In hilly areas not bounded by snow.
ii) In urban areas with frequent intersections.
5 What is vertical curve? Write its basic equation.
6 Define set back distance.
7 Explain need of Delineators.
8 What is Safety Barriers? Draw some types of it.
9 What are the different facilities provided for Pedestrians on Urban roads?
10 Mention IRC codes required for Bus-Bay Design and Cycle-Track design?

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11 a) Define Road Roughness. Explain any one method of measurement of Road Roughness.
b) Calculate the SSD on highway at a descending gradient of 3% for a design speed of 90 Kmph. Assume other data as per IRC recommendations.

12 a) Mention the design criteria for summit curve & valley curve, with neat sketches?
b) The radius of horizontal circular curve is 100m. The design speed is 50 Kmph. Assume standard value of lateral friction.
i) Calculate the super elevation required if full lateral friction is assumed to develop.
ii) Calculate the Coefficient needed if no super elevation is provided.

13 a) What are Grade separated Interchanges. Mention the design criteria as per IRC.
b) Describe the design principles for Intersections as per IRC.

14 a) Draw a neat sketch of Rotary Intersection. Write the design procedure including its advantages & disadvantages.
b) List various Traffic Impact Attenuators as per IRC & draw them.

15 a) Write in detail about types & objectives of road Markings.
b) A Vertical Summit Curve is found with two gradients +0.3% & - 5.0%. Design the length of Summit Curve to provide SSD for design speed of 80 Kmph.

16 a) What is the standard space (Length X width X Head room) parking requirement for
i) Light goods vehicles ii) Medium / Heavy vehicles iii) Mini-Buses
iv) Container vehicles v) Motor cycles vi) Cars
b) Discuss the guidelines for cycle tracks with neat sketches.

17 Write short notes on any two of the following:
a) Pavement surface characteristics.
b) Extra widening on curves.
c) Warrants for Grade Separated intersections.
d) Guidelines on design of sub-ways.

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Code No. 849/2819/CBCS

FACULTY OF ENIGNEERING

B.E. VIII-Semester (CBCS) (ECE) (Main) Examination, September 2020

Subject : Real Time Operating System (Elective – V)

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

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)]**

1. What are the objectives of operating system?
2. Draw the layered structure of an Operating System.
3. Define the critical section of a code.
4. Classify the real time systems based on time constraints.
5. Differentiate between message queues and pipes.
6. What is the principle of deadlock?
7. List out the features of RTOS V_x works.
8. Draw the task state transition diagram.
9. What do you mean by system call?
10. What is the function fork system call?

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11. a) Describe the evolution of operating systems.
    b) Write the features of Real time operating Systems.

12. a) Illustrate resources parameters of Jobs and Parameters of resources in real time systems.
    b) Differentiate hard vs soft real time systems.

13. a) Explain the reader writer problem of synchronization.
    b) Discuss the principle of deadlock with example.

14. a) Explain the overview of Threads and Tasks.
    b) Compare V_x Works, μC/OS-II and RT linux.

15. a) Explain the Process control phenomenon based on different UNIX commands.
    b) Write the function of the following :
    i) Iseek ii) waitpid

16. a) With a neat sketch, explain periodic task model of real time systems.
    b) Discuss in brief about the Interrupt services.

17. a) With a neat block diagram explain process management in RT Linux.
    b) Explain the priority inversion with necessary diagrams.

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Code No: 850/2820/CBCS

FACULTY OF ENGINEERING

B.E. VIII-Semester (CBCS) (ECE) (Main) Examination, September 2020

Subject : Fuzzy Logic & Applications (E-V)

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

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1 Differentiate Crisp sets & Fuzzy sets.
2 Write the DeMorgan's laws & Excluded middle laws for Fuzzy sets.
3 What is a Fuzzy relation? Give an example
4 Define Fuzzy Cartesian product?
5 Define membership function with an example.
6 Define Fuzzification. List the different Fuzzification methods.
7 Define DeFuzzification.List the different DeFuzzification methods.
8 Discuss any one DeFuzzification method.
9 Justify FAMs as mapping.
10 What is an Adaptive FAM system?

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11 a) State all the operations & properties of Fuzzy sets.
b) Given A={0.2/1+0.3/2+0.6/4+0.7/5}, B={0.1/1+0.2/2+0.8/3+0.9/4} & C={0.3/1+0.4/3+0.5/4+0.6/5}. Prove all the operations & properties of Fuzzy sets.

12 What are Similarity relations? Consider the Similarity relation.

	1	0.7	0.3	0.6	0.7
R (X,X)=	0.7	1	0.3	0.6	0.9
	0.3	0.3	1	0.3	0.3
	0.6	0.6	0.3	1	0.6
	0.7	0.9	0.3	0.6	1

Draw the partition tree for the above Similarity relation.

13 What is Fuzzification? Explain in detail any four Fuzzification methods.

14 What is DeFuzzification? Explain in detail any four DeFuzzification methods.

15 Explain in detail the basic structure & operation of Fuzzy logic control system with an example.

16 a) Explain in detail operations on type-2 Fuzzy sets.
b) Consider $\mu_A(x)$={0.3/0.4+0.7/0.8} & $\mu_B(x)$={0.1/0.1+0.5/0.2+1/0.4}.
Calculate: (i) uA∩B (x), (ii) uAUB (x), (iii) uAB (x), (iv) μA+^B (x) & (v). μĀ (x).

17 Explain in detail Bidirectional FAM theorem for
a) Correlation-Minimum Encoding
b) Correlation-Product Encoding

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Code No: 851/2821/CBCS

FACULTY OF ENGINEERING

B.E (CBCS) (ECE) VIII-Semester (Main) Examination, September 2020

Subject : Radar Systems (Elective – V)

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

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1 Discuss relation between *prf and range* of RADAR.
2 Describe effect of radar cross section of targets in RADAR
3 Discuss Doppler effect
4 Compare various Low Noise Front Ends w.r.t frequency
5 Explain three pulse canceller with neat diagram
6 Explain Blind Speeds in RADAR Systems
7 Distinguish between Azimuth and Elevation angles
8 Compare the performance of various trackers in radar
9 Define directive gain of the antenna
10 Identify components of Environmental Noise

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11 (a) Develop simple form of Radar equation.
(b) Explain Integration of radar pulses.

12 (a) Discuss Multiple frequency CW radar.
(b) Describe transmit and receive conditions in balanced duplexer with near diagram

13 (a) Explain MTI radar with power amplifier transmitter with neat block diagram.
(b) Discuss the limitations of MTI radar.

14 (a) Explain conical scan with near diagram.
(b) Discuss Phase comparison Monopulse tracking radar

15 (a) Discuss placement of the feeds in parabolic reflector antenna with neat diagrams.
(b) Compare Cosecant squared antenna pattern with Cassegrain antenna.

16 (a) Explain any four system losses in radars
(b) Explain the working of FM – CW radar with neat diagram.

17 (a) Discuss Tracking in Range.
(b) Discuss Effect of surface reflection.

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OU - 1607 OU - 1607

Code No: 852/2822/CBCS

FACULTY OF ENGINEERING

B.E (CBCS) (ECE) VIII-Semester (Main) Examination, September 2020

Subject : Digital of Fault Tolerant Systems (Elective – V)

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

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1 Define Reliability
2 Give the reliability of i) Hybrid ii) Triplicated TMR Redundancy Schemes
3 Define a) Availability b) Test Coverage
4 Define fail – soft operation
5 Explain reliability improvement factor (RIF) for mission time 'T'.
6 List the different intervals in system repair time.
7 Draw the circuit of the Two – Rail checker
8 Define controllability and observability
9 Give the syndrome of 2-input and AND and NANDGate.
10 Graphically represent optimization in constrained design of a circuit

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11 Explain in detail the modeling of faults.

12 Illustrate the 5MR reconfigurations scheme for implementing fault tolerance explain the blocks in derail with 1,2 and 3 module failures

13 Explain the following practical fault tolerant systems i) Sift ii) Pluribus

14 (a) Explain in detail the design of k-out-of-2k checker assuming k=2
(b) Explain the type 2 partially self – checking network

15 (a) For F (A, B, C, D, E, F) = BEF + BCF + ACF+BDE+ACDE+ABCD Give a testable design using three level OR – and – OR technique .
(b) Give a testable realization of the function F=A'B'C+AB'C' using control logic

16 (a) Explain the elementary switch used in self-purging redundancy
(b) How is fault tolerance implemented in the Japanese bullet train?

17 Write short notes on
(a) Boolean Difference.
(b) Partition Theory
(c) Reed – Muller expansion Technique

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Ou - 1607 OU - 1607

Code No. 865/2975/CBCS

FACULTY OF ENGINEERING

B.E. (Mech./P/AE) (CBCS) VIII – Semester (Main) Examination, September 2020

Subject : Energy Conservation and Management (Elective – V)

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

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1. Define energy conservation
2. What are the various forms of energy?
3. List the thermal storage systems.
4. Explain the concept of power.
5. Define the combustion principles
6. Distinguish the working principle of Motors and Generators?
7. Mention the applications of CECP method.
8. Identify the energy in efficient facilities
9. Define a production system.
10. State Market Penetration

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11. a) Describe in detail about the Indian energy scenario.
    b) Explain the principle energy conservation and identify potential sources of energy losses

12. Explain the working principles of Recuperator with the help of neat sketch

13. Discuss the combustion of coal and measures for improving combustion process.

14. Describe the procedure for comprehensive energy conservation planning.

15 a) Interpret maximum thermodynamic efficiency.
    b) Describe a Primary copper production system.

16. Discuss in detail about the Methodology for forecasting Industrial Energy Supply and Demand.

17. Demonstrate the applications of CECP method with suitable example.

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OU - 1607 OU - 1607

Code No. 866/2976/CBCS

FACULTY OF ENGINEERING
B.E. (M/P/AE) VIII Sem. (CBCS) (Main) Examination, September 2020

Subject: Advanced Propulsion and Space Science (PE-V)

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

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1. What are reflected shock waves?
2. What are conical shock waves?
3. What is bipropellant liquid of Rocket engine?
4. What is combined cycle propulsion of Rocket engine?
5. Mention the applications of Rocket technology?
6. What is pulsed detonation engines?
7. Define Kepler's equation of Celestial Sphere?
8. What is meant by parking orbits of artificial satellites?
9. What is meant by earth and space segment?
10. Mention the Principles of remote sensing.

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11. a) Explain high temperature and low density flows in Gas Dynamics.
    b) Discuss the importance of hypersonic flow in Gas Dynamics.

12. a) Discuss in detail Electric/Ion propulsion system.
    b) Explain the design and operating parameters of rocket engines.

13. a) Discuss in detail Testing and Instrumentation of Rocket Technology.
    b) Explain the acceleration – staging of rockets and feed systems.

14. a) Discuss in detail the Principles of remote sensing.
    b) Explain the minimum energy interplanetary transfer orbits of artificial satellites.

15. a) Explain the working details of navigational satellites.
    b) Discuss in detail the operation and maintenance of meteorological satellites.

16. Explain the Perturbations of artificial satellites due to atmospheric drag and flattening of earth.

17. Write short notes on the following:
    a) Nuclear Processes in the Sun
    b) Celestial Sphere
    c) Electric Propulsion

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OU - 1607 OU - 1607

Code No. 867/2977/CBCS

FACULTY OF ENGINEERING
B.E. (M/P/AE) VIII Sem. (CBCS)(Main) Examination, September 2020

Subject: Waste Heat Recovery and Co-Generation (PE-V)

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

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1. Define the term waste heat?
2. What are the direct and indirect benefits of waste heat recovery?
3. Mention commercial waste heat recovery devices.
4. What is the principle of 'recuperators'?
5. What is the principle of run around coil heat exchanger?
6. What is cogeneration? Mention its benefits.
7. Explain the concept of porosity in WHRS?
8. What is pressure drop considerations of LMTD?
9. Mention the applications of Cogeneration to a steam power plant.
10. What is the impact of Cogeneration on fuel use patterns?

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11. a) Discuss the need of storage systems for waste heat.
    b) Discuss on Utilization of Waste Heat Energy requirements of industry.

12. a) Explain the design of heat exchanger for number of tubes.
    b) Explain Gas to liquid and liquid to liquid heat exchangers.

13. a) Explain the concept and design of recuperators.
    b) Discuss on selection of material for heat storage and recovery.

14. a) Explain Gas turbine based cogeneration system with neat sketch.
    b) Explain cogeneration of reciprocating engine cycle with neat sketch.

15. a) Mention the applications of cogeneration to a steam power plant.
    b) Discuss the integration system of steam turbine and gas turbine.

16. Discuss on legislative, environment and institutional constraints for use of waste heat.

17. Write short notes on:
    a) NTU methods
    b) Applications towards power generation
    c) Power plants and FUA

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