

TRANSFORM THEORY

Time: 3 Hours

MaxMarks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Find $Z(n)$ using $Z(n)$ Show that $Z(na^n) = \frac{az}{(z-a)^2}$ 7M
 b) Find the value of $Z(\cosh at \sin bt)$ 7M
 (OR)
 2. a) If $Z(u_n) = \frac{z}{z-1} + \frac{z}{z^2+1}$, find the Z-transform of u_{n+2} 10 M
 b) Find the Z-transform of $u_n = \frac{a^n e^{-a}}{n!}$ 4 M

UNIT-II

3. a) Find $Z^{-1}\left[\frac{z^2+z}{(z-1)^2}\right]$ 7M
 b) Using Convolution Theorem, evaluate $Z^{-1}\left[\left(\frac{z}{z-a}\right)^2\right]$ 7M
 (OR)
 4. a) Find $Z^{-1}\left[\frac{z^2-3}{(z+2)(z^2+1)}\right]$ 7M
 b) Using Convolution Theorem, evaluate $Z^{-1}\left[\frac{z^2}{(z-4)(z-5)}\right]$ 7M

UNIT-III

5. Using Fourier integral show that $e^{-x} \cos x = \frac{2}{\pi} \int_0^\infty \frac{\lambda^2+2}{\lambda^2+4} \cos \lambda x \, d\lambda$. 14M
 (OR)
 6. Find the Fourier sine transform of $f(x) = \frac{e^{-ax}}{x}$ and deduce that $\int_0^\infty \frac{e^{-ax} - e^{-bx}}{x} \sin x \, dx = \tan^{-1}\left(\frac{s}{a}\right) - \tan^{-1}\left(\frac{s}{b}\right)$ 14M

UNIT-IV

7. Find the Fourier transform of $f(x)$ defined by $f(x) = \begin{cases} 1-x^2, & |x| \leq 1 \\ 0, & |x| > 1 \end{cases}$ and hence evaluate $\int_0^\infty \frac{x \cos x - \sin x}{x^3} \cos \frac{x}{2} \, dx$ 14M
 (OR)
 8. Find the inverse Fourier sine transform of $f(x)$ of $F_s(p) = \frac{e^{-ap}}{p}$ and hence deduce $F_s^{-1}\left(\frac{1}{p}\right)$. 14M

UNIT-V

9. Solve the difference equation, using Z-transform $y(n+2) - 4y(n+1) + 3y(n) = 0$, given $y(0) = 2, y(1) = 4$ 14M
 (OR)
 10. Solve $y(n+2) - y(n) = 2^n$ where $y(0) = 0, y(1) = 1$. 14M

AR16

CODE: 16CE2006

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech II Semester Regular Examinations, April-2018

**FUNDAMENTALS OF BUILDING PLANNING
(Open Elective - II)**

Time: 3 Hours

Max Marks: 70

INSTRUCTIONS:

- Question paper consists of Five Questions from respective units with internal choice.
- Each question carries 14 Marks **(5X14M=70M).**

Answer all five questions selecting **one question from each unit.**

UNIT-I

1. a) Explain any four modern building materials? 6M
b) Explain tests on bricks? 8M

(OR)

2. a) Explain the structure of timber with a neat sketch? 8M
b) Explain different types of sanitary fixtures? 6M

UNIT-II

3. a) What are the requirements of parts of a residential building? Explain them 8M
b) What are the minimum standards or requirements of a staircase? 6M

(OR)

4. a) Explain the characteristics of various types of residential buildings? 8M
b) What are the minimum standards or requirements of varandah? 6M

UNIT-III

5. a) Explain advantages and disadvantages of pitched roof? 8M
b) Explain different types of windows with neat sketches? 6M

(OR)

6. a) Explain different types of doors and its components with neat sketches? 8M
b) What is brick masonry? Describe briefly about brick masonry. 6M

UNIT-IV

7. a) Explain the classification of buildings? 8M
b) Explain about floor area ratio and floor space index? 6M

(OR)

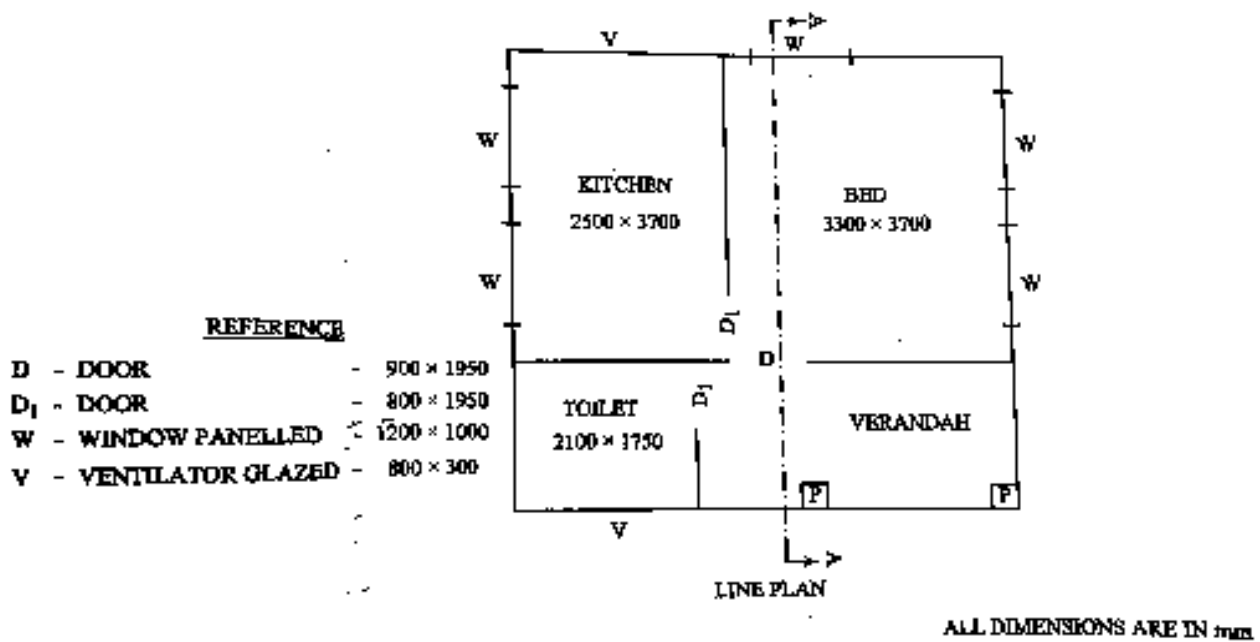
8. a) What are building byelaws? Explain the objectives of building byelaws? 8M
b) Explain about height of the building? 6M

UNIT-V

9. Draw the plan and section of a given line diagram of residential building. 14M

(OR)

10. Draw Section and elevation of a residential building with neat diagram. 14M



AR16

CODE: 16OE2023

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech II Semester Regular Examinations, April, 2018

RENEWABLE ENERGY SOURCES

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. Define solar irradiance, solar constant, extra-terrestrial and terrestrial Radiations? **14M**
What is the standard value of solar constant?
(OR)
2. a) Explain the role and potential of renewable energy sources **6M**
b) Explain the working of a Pyranometer solar energy measuring instrument? **8M**

UNIT-II

- 3 Explain different types of concentrating type collectors? **14M**
(OR)
4. a) How is the performance of a flat plate collector evaluated? **8M**
b) Compare the performance of various types of solar collectors **6M**

UNIT-III

5. Give the detailed classification of wind machine. Explain anyone type of wind machine with neat sketch **14M**
(OR)
6. a) What are the main advantages and disadvantages of bio-mass energy? Explain the process of photosynthesis **7M**
b) Explain the process of anaerobic fermentation **7M**

UNIT-IV

7. a) What are the different types of geothermal resources **8M**
b) With neat sketch explain the various methods of Tidal power generation **6M**
(OR)
8. Discuss the theory and working principle of ocean thermal energy conversion system **14M**

UNIT-V

9. a) Explain the principles of direct energy conversion **8M**
b) Explain the principle of MHD power generation. **6M**
(OR)
10. Write a short note on **14M**
i) thermodynamic aspects of direct energy conversion
ii) Carnot cycle
iii) Faraday's laws

AR16

CODE: 16OE2024

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech II Semester Regular Examinations, April, 2018

PRINCIPLES OF MECHANICAL MEASUREMENTS

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. What is the difference between accuracy and precision and also Discuss the various types of errors? **14**
- (OR)**
2. a) Discuss about the time response of first order system for **6**
 - i. Impulse input
 - ii. Step input
 - iii. Ramp input
- b) Explain in detail about following terms: **8**
 - i. Speed of response
 - ii. Measuring lag
 - iii. Fidelity
 - iv. Dynamic error

UNIT-II

3. Illustrate the bellows arrangement used to measure differential pressure. **14**
- (OR)**
4. Explain the principle and working of hot wire anemometer. **14**

UNIT-III

5. Explain working of any one low temperature measurements? **14**
- (OR)**
6. Explain the principle behind the temperature measurement by optical pyrometer? **14**

UNIT-IV

7. Working of LVDT and RVDT used in inductive transducer? **14**
- (OR)**
8. Explain principle and construction of capacitive transducer to measure linear and angular displacements? **14**

UNIT-V

9. Discuss about stroboscope in detail with neat sketch? **14**
- (OR)**
10. Working of mechanical torsion meter with neat schematics? **14**

AR16

CODE: 16OE2025

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech II Semester Regular Examinations, April, 2018

PRINCIPLES OF COMMUNICATIONS

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

- | | | | |
|------|----|--|-----|
| 1. | a) | Explain different elements of general communication system | 10M |
| | b) | Obtain the Fourier Transform of a signum function | 4M |
| (OR) | | | |
| 2. | a) | Explain the concept of correlation and convolution | 10M |
| | b) | Define Auto correlation function with example | 4M |

UNIT-II

- | | | | |
|------|----|---|-----|
| 3. | a) | What is modulation and Explain the need of modulation | 4M |
| | b) | An AM Transmitter is radiating 132 KW when a certain audio sine wave is modulating it to a depth of 80% and 150KW when a second sinusoidal audio sine wave also modulates it simultaneously. What is the depth of modulation for second audio wave. | 10M |
| (OR) | | | |
| 4. | a) | Explain about the square law detector with neat diagram | 10M |
| | b) | List out the advantages of frequency modulation over amplitude modulation | 4M |

UNIT-III

- | | | | |
|------|--|---|-----|
| 5. | | Describe pulse width modulation and pulse position modulation in detail | 14M |
| (OR) | | | |
| 6. | | What is sampling. State and explain sampling theorem for band limited signals | 14M |

UNIT-IV

- | | | | |
|------|----|---|----|
| 7. | a) | Explain about Frequency shift keying | 7M |
| | b) | Describe about phase shift keying with wave forms | 7M |
| (OR) | | | |
| 8. | a) | What is quantization and explain the effect of quantization | 7M |
| | b) | Draw and explain the block diagram of a simple delta modulation circuit | 7M |

UNIT-V

- | | | | |
|------|----|---|-----|
| 9. | | Explain about Shannon – Fano code with an example | 14M |
| (OR) | | | |
| 10. | a) | Explain the concept of information and entropy | 10M |
| | b) | Explain about the coding efficiency | 4M |

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) What is an object oriented programming? Explain principals of OOPs? **7M**
b) Explain Primitive type conversion and casting with examples. **7M**
(OR)
2. a) Explain different types of operators in java with suitable examples. **7M**
b) Write a Java Program to find Sum of Natural Numbers. **7M**

UNIT-II

3. a) Write syntax for defining a class and how to access members of class through object explain with suitable example. **10M**
b) List the various ways of 'static' keyword usage **4M**
(OR)
4. What is a overloading? What are its special properties? Explain Constructor and Method Overloading with suitable example. **14M**

UNIT-III

5. a) Write a program to implement multiple inheritances by using interfaces. **7M**
b) What is a package? Explain the different access controls for packages in Java **7M**
(OR)
6. What are the benefits of inheritance? Explain various forms of inheritance with Suitable code segments. **14M**

UNIT-IV

7. What is an exception? How are exceptions handled in Java programming? Explain. **14M**
(OR)
8. a) Explain user defined exceptions with suitable example? **7M**
b) Explain the following exceptions with the help of examples: **7M**
(i) Arithmetic Exception (ii) Array index out of Bound Exception

UNIT-V

9. What are the two ways to create the threads? Explain with suitable example. **14M**
(OR)
10. a) What is thread? Explain the life cycle of the thread? **7M**
b) Write a Java program that creates two threads. First thread prints the numbers from 1 to 50 and the other thread prints the numbers from 100 to 50. **7M**

AR16

CODE: 16OE2027

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech II Semester Regular Examinations, April, 2018

INTRODUCTION TO PYTHON

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

- | | | |
|-------------|---|------------|
| 1. a) | What is an operator? Explain different types of operators available in python | 10M |
| b) | Explain the history of python | 4M |
| (OR) | | |
| 2. a) | Explain the features of python | 7M |
| b) | Explain data types and variables in python | 7M |

UNIT-II

- | | | |
|-------------|--|-----------|
| 3. a) | Explain Control statements with examples | 7M |
| b) | Explain Conditional statements with examples | 7M |
| (OR) | | |
| 4. a) | Write a program to print prime numbers up to given range | 7M |
| b) | Write a program to print Fibonacci numbers up to given range | 7M |

UNIT-III

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|-------------|--|-----------|
| 5. a) | What is a set? Explain different set operations in python | 7M |
| b) | What is a string? Explain different string operations in python | 7M |
| (OR) | | |
| 6. a) | What is a tuple? Explain different tuple operations in python | 7M |
| b) | Explain the differences between strings and lists and also explain list operations | 7M |

UNIT-IV

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|-------------|--|-----------|
| 7. a) | What is a file? Explain file functions in python | 7M |
| b) | Explain different types of exceptions in python | 7M |
| (OR) | | |
| 8. a) | What is an exception? Explain exception handling mechanism | 7M |
| b) | Write a program to implement exception handling mechanism | 7M |

UNIT-V

- | | | |
|-------------|--|-----------|
| 9. a) | What is an object? Explain the object oriented programming concepts | 7M |
| b) | What is a class? Explain operator overloading mechanism with one example | 7M |
| (OR) | | |
| 10. a) | What is an inheritance? Explain inheritance mechanism with one example. | 7M |
| b) | Write a program to implement polymorphism concepts | 7M |

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a Find the regular function $f(z)$ whose imaginary part is $\log(x^2 + y^2) + x - 2y$ **7M**
 b If $f(z)$ is a regular function of z , prove that $(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2})|f(z)|^2 = 4 \cdot |f'(z)|^2$ **7M**
- (OR)
2. Using Milne - Thompson method, find the analytic function $f(z) = u + iv$ if $u - v = e^x(\cos y - \sin y)$ **14M**

UNIT-II

3. Verify Cauchy theorem for the integral of Z^3 taken over the boundary of the rectangle with vertices $-1, 1, 1+i, -1+i$. **14M**
- (OR)
4. a) Apply Cauchy's integral formula to evaluate $\int_C \frac{z+1}{z^3-4z} dz$ where C is $|z+2|=1.5$ using Cauchy's integral formula **7M**
 b)) Evaluate $\int_C \frac{e^{3z}}{(z+1)^4} dz$ where C is $|z|=3$ using Cauchy's integral formula. **7M**

UNIT-III

5. a) Find the Laurent series expansion of the function $f(z) = \frac{e^z}{(1-z)z}$ about the point $z=1$ **7M**
 b) Express $f(z) = \frac{z}{(z-1)(z-3)}$ in a series of positive and negative powers of $(z-1)$ **7M**

(OR)

- 6 Expand $f(z) = \frac{(z-2)(z+2)}{(z+1)(z+4)}$ in the region i) $1 < |z| < 4$ ii) $|z| < 1$ **14M**

UNIT-IV

7. Find the poles and residues of $f(z) = \frac{z^2-2z}{(z+1)^2(z^2+1)}$ **14M**
- (OR)
8. a) Evaluate $\oint_C \frac{\cos z}{(z-\pi/6)^3} dz$ where C is the circle $|z|=1$. **7M**
 b)) Using residue theorem, evaluate $\int_C \frac{2z-1}{z(z+1)(z-3)} dz$ where c is the circle $|z|=4$ **7M**

UNIT-V

9. Evaluate $\int_0^\infty \frac{dx}{(x^4+a^4)}$ **14M**
- (OR)
- 10 Evaluate $\int_0^{2\pi} \frac{\sin 3\theta}{(5-3\cos\theta)} d\theta$ using residue theorem. **14M**

AR16

CODE: 16OE2029

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech II Semester Regular Examinations, April, 2018

Computational Number Theory

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

- | | | |
|------|--|----|
| 1. a | Obtain gcd of 595 and 252 | 7M |
| b | Express 595 and 252 in the form of $m \cdot 252 + n \cdot 595$ | 7M |

(OR)

- | | | |
|-------|--|----|
| 2. a. | Prove that $n(n-1)(2n-1)$ is divisible by 6 | 7M |
| b. | Show that the product of two numbers of the form $6n+1$ is also $6n+1$ | 7M |

UNIT-II

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|----|---|-----|
| 3. | Show that $3^{n+2} - 8n - 9 \equiv 0 \pmod{64}$ | 14M |
|----|---|-----|

(OR)

- | | | |
|----|--|-----|
| 4. | Solve the congruence $259x \equiv 5 \pmod{11}$ | 14M |
|----|--|-----|

UNIT-III

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|----|---|-----|
| 5. | Define Euler-Fermate theorem. Hence, Show that $n^{12} - a^{12}$ is divisible by 13 | 14M |
|----|---|-----|

(OR)

- | | | |
|----|---|-----|
| 6. | Define Wilson theorem. Hence, show that $(12! + 1)$ is divisible by 13. | 14M |
|----|---|-----|

UNIT-IV

- | | | |
|----|---|-----|
| 7. | Define Mobius function μ . Determine $\mu(17), \mu(20)$ | 14M |
|----|---|-----|

(OR)

- | | | |
|----|--|-----|
| 8. | Define Euler Totient Function Φ . Determine $\Phi(360)$ | 14M |
|----|--|-----|

UNIT-V

- | | | |
|----|-------------------------------|-----|
| 9. | Evaluate $(2/7)$ and $(2/19)$ | 14M |
|----|-------------------------------|-----|

(OR)

- | | | |
|-----|--|-----|
| 10. | Determine whether 219 is quadratic residue of 383 or not | 14M |
|-----|--|-----|

AR16

CODE: 16OE202A

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech II Semester Regular Examinations, April, 2018

REMOTE SENSING

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) Explain basic components of Remote sensing? 7M
b) How do you understand by scattering of EMR? 7M
(OR)
2. a) How electromagnetic radiation does interact with water? 7M
b) Explain different bands in electromagnetic spectrum with sketch? 7M

UNIT-II

3. a) Write about passive sensors and mention the parameters of LISS III and WiFis sensors? 7M
b) Describe the different resolutions of the sensor? 7M
(OR)
4. a) Write the different between active and passive remote sensing system? 7M
b) Write about high resolution sensors? 7M

UNIT-III

5. a) What is platform? write different air borne platforms that are used in remote sensing 7M
b) Write different space borne platforms that are used in remote sensing 7M
(OR)
6. a) Write about IRS series of satellites 7M
b) Write about Spot series of satellites 7M

UNIT-IV

7. a) List out the various elements that are to be considered during visual interpretation? 7M
b) List out various pre-processing methods and describe geometric correction method 7M
(OR)
8. a) Describe various elements of visual interpretation? 7M
b) Explain different techniques used for image enhancement? 7M

UNIT-V

9. a) Explain classification of an image 7M
b) Write about supervised classification 7M
(OR)
10. a) List out various methods of supervised classification 7M
b) Write about training data set? 7M

AR13

CODE: 13CE2009
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

Set- 2

II B.Tech II Semester Supplementary Examinations, April, 2018

CONCRETE TECHNOLOGY

(Civil Engineering)

TIME: 3 Hours

Max.Marks:70

PART-A

ANSWER ALL QUESTIONS

[1X10 = 10M]

1. a) Define hydration of cement?
- b) List the different ingredients of cement?
- c) What is final setting time of cement?
- d) What are the tests conducted on aggregates?
- e) Write any one property of accelerating admixture?
- f) What is shrinkage of concrete?
- g) What are the various methods of compaction of concrete?
- h) Define characteristic strength of concrete?
- i) What is the function of sand in concrete?
- j) Mention the tolerable concentration of any two impurities in water for its chemical reaction with cement?

PART-B

Answer one question from each unit

[5 X12 = 60M]

UNIT-I

2. What are the main stages in the manufacture of Portland cement? What is their role? (12M)
- (OR)**
- 3.a) What is the difference between false set, initial set and final set? (6M)
 - b) What are the advantages and disadvantages of superplasticizers? (6M)

UNIT-II

- 4.a) How does the shape of aggregate particles influence the properties of fresh concrete? (6M)
 - b) What is the influence of fineness modulus on the properties of concrete mixes? (6 M)
- (OR)**
- 5.a) What are the tests to measure workability of concrete? Explain any two tests? (7M)
 - b) Define the term bleeding? Discuss the factors affecting bleeding of concrete? (5M)

UNIT-III

- 6.a) Define maturity of concrete? What are the limitations on prediction of strength of concrete from its maturity? (7M)
 - b) Write short notes on curing methods? (5M)
- (OR)**
7. a) Write a note on different tests to be conducted on hardened concrete to determine its composition? (5M)
 - b) Explain the purpose of determining the ultrasonic pulse velocity of concrete and the method of determining ultrasonic pulse velocity of concrete? (7M)

UNIT-IV

8. Define creep? What are the factors effecting creep? Write down the relation between creep and time? (12M)
- (OR)**
9. Define modulus of elasticity and shrinkage? Write types of shrinkage? (12M)

UNIT-V

10. Define durability of concrete? Write about quality control of concrete? (12M)
- (OR)**
11. Design M20 grade concrete as per BIS code for the following data: (12M)
- Maximum size of coarse aggregate - 20 mm
 - Degree of quality control – good
 - Type of exposure – mild
 - Specific gravity of cement – 3.15
 - Specific gravity of fine aggregate – 2.6
 - Specific gravity of coarse aggregate – 2.6
 - Assume any missing data suitably.

AR13

CODE: 13ME2010

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech II Semester Supplementary Examinations, April, 2018

DESIGN OF MACHINE MEMBERS - I (Mechanical Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What are factors to be considered for selection of materials for the design of elements
b) What do you mean by factor of safety
c) What is the material used for rivets
d) State how welded joint is differ from riveted joint
e) What do you mean by double start threads
f) Write down lames equation to find thickness of cylinder
g) What is effect of keyway cut into the shaft
h) What is purpose of turn buckle
i) What are applications of flexible coupling
j) What is free length of spring

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) State and illustrate any two principal design rules for casting 4M
b) The load on a bolt consists of an axial pull of 10kN together with a transverse shear force of 5 kN. Find the diameter of bolt according to all theories of failure 8M
- (OR)
3. A hot rolled steel shaft is subjected to a torsional moment that varies from 330N-m clockwise to 110N-m counter clockwise and an applied bending moment at a critical section varies from 440N-m to -220N-m. the shaft is of uniform cross section and no keyway is present at critical section. Determine the required shaft diameter. The material has an ultimate strength of 550MN/m² and a yield strength of 410MN/m². Take factor of safety 2 size factor 0.8 and surface finish factor of 0.62 12M

UNIT-II

4. Design the longitudinal joint for a 1.25m diameter steam boiler to carry a steam pressure of 2.5N/mm². The ultimate strength of the boiler plate may be assumed as 420MPa crushing strength as 650MPa and shear strength as 300MPa. Take the joint efficiency as 80%. Sketch the joint with all the dimensions. Adopt the suitable factor of safety. 12M
- (OR)
5. Derive expressions for stress in welded joint when it is eccentrically loaded 12M

UNIT-III

6. A steam engine cylinder has an effective diameter of 350 mm and the maximum steam pressure acting on the cylinder cover is 1.25 N/mm^2 . Calculate the number and size of studs required to fix the cylinder cover, assuming the permissible stress in the studs as 33 MPa. 12M
- (OR)
7. A mild steel cover plate is to be designed for an inspection hole in the shell of a pressure vessel. The hole is 120mm in diameter and the pressure inside the vessel is 6 N/mm^2 . Design the cover plate along with the bolts. Assume allowable tensile stress for mild steel as 60MPa and for bolt material as 40MPa. 12M

UNIT-IV

8. a) A steel shaft has a diameter of 25 mm. The shaft rotates at a speed of 600 r.p.m and transmits 30kW through a gear. The tensile and yield strength of material of shaft are 650 MPa and 353MPa respectively. Taking a factor of safety 3 select a suitable key for the gear .Assume that the key and shaft are made of the same material. 4M
- b) Two mild steel rods 40mm diameter are to be connected by a cotter joint.The thickness of the cotter is 12mm. Calculate the dimensions of the joint, if the maximum permissible stresses are 46MPa in tension 3MPa in shear and 70MPa in crushing. 8M
- (OR)
- 9 a) Define equivalent twisting moment and equivalent bending moment. State when these two terms are used in design 4M
- b) A hollow shaft of 0.5 m outside diameter and 0.3m inside diameter is used to drive a propeller of a marine vessel. The shaft is mounted on bearings 6 metre apart and it transmits 5600kW at 10 r.p.m. The maximum axial load propeller thrust is 100kN and the shaft weighs 70kN. Determine 1. The maximum shear stress developed in the shaft and angular twist between the bearings 8M

UNIT-V

10. a) Design a muff coupling to connect two shafts transmitting 40kW at 120 rpm. The permissible shear and crushing for the shaft and key material are 30MP and 80MPa respectively. The material of muff is cast iron with permissible shear stress of 15MPa. Assume that the maximum torque transmitted is 25% greater than the mean torque 8M
- b) Briefly explain types of shaft coupling 4M
- (OR)
11. Design a helical spring for a spring loaded safety valve for the following conditions Diameter of valve seat=65mm ; operating pressure = 0.7 N/mm^2 ;Maximum pressure when the valve blows off freely = 0.75 N/mm^2 ;Maximum lift of the valve when pressure rises from 0.7 to 0.75 N/mm^2 = 3.5 mm . Maximum allowable stress =550MPa; Modulus of rigidity = 84 kN/mm^2 ;Spring index=6; Draw neat sketch of spring. 12M

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech II Semester Supplementary Examinations, April, 2018

OBJECT ORIENTED PROGRAMMING

(Common to CSE & IT)

Time: 3 Hours

Max Marks: 70

PART-A

Answers ALL Questions

[10 X 1 = 10M]

1. a) What is an Abstraction?
b) Give one example for type casting.
c) What is static key word?
d) What is passing by reference?
e) Give one difference between abstract class and an interface?
f) What is a nested package, give one example java package for it?
g) What is the difference between 'throw' and 'throws' in exception handling?
h) Give the syntax for activation of a thread that implements Runnable interface.
i) Give any two methods in MouseListener interface.
j) What is the difference between Applet and Frame?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) What are the rules to be followed for declaring a variable? [8M]
Explain various variable types
b) Write a program for identifying large element in an Array. [4M]
- (OR)**
3. a) What is an access specifier? Discuss various types of access specifiers with syntax. [7M]
b) Write a program that prints the sum of elements of a matrix row wise. [5M]

UNIT-II

4. a) What is an Object? Explain the process for obtaining it from its class with an example. [5M]
b) Write a program that creates a class called 'Rectangle' having variable length, width and method areacalc() that calculates area of Rectangle, also creates a main class that creates a Rectangle object and access its members. [7M]

(OR)

5. a) What is a constructor? Prove that object independency can be achieved through constructor overloading? [8M]
b) What is method overloading? Write an example code for achieving it. [4M]

UNIT-III

6. What is Runtime polymorphism? Write a program that creates a **Room** parent class giving the properties to the classes **BedRoom** and **DrawingRoom** that overrides parent methods **dispName()** and **dispDimensions()**. Also perform Runtime Polymorphism. [12M]

(OR)

7. a) What is the significance of final key word? Explain its behavior with variable, method and class with syntaxes [5M]
b) What is a package? Write one example program for it. [7M]

UNIT-IV

8. a) What are the various ways of handling multiple exceptions? Explain with example codes [8M]
b) With the help of proper code segments, explain the usage of throw and throws key words. [4M]

(OR)

9. What is a Thread? Explain about various ways of creating threads with examples. [12M]

UNIT-V

10. What is event delegation model? Explain various types of event managers. [12M]

(OR)

11. a) Explain life cycle of an applet, with the help of a program. [6M]
b) Write a program to implement the border Layout [6M]