



# GITAM INSTITUTE OF TECHNOLOGY

## GITAM UNIVERSITY

(Declared as deemed-to-be-University u/s 3 of UGC Act, 1956)

Rushikonda, Visakhapatnam-530 045(AP)

Accredited by NAAC with 'A'Grade

### DEPARTMENT OF CIVIL ENGINEERING

### Model Question Paper for Ph.D. Entrance Examination (2012-13)

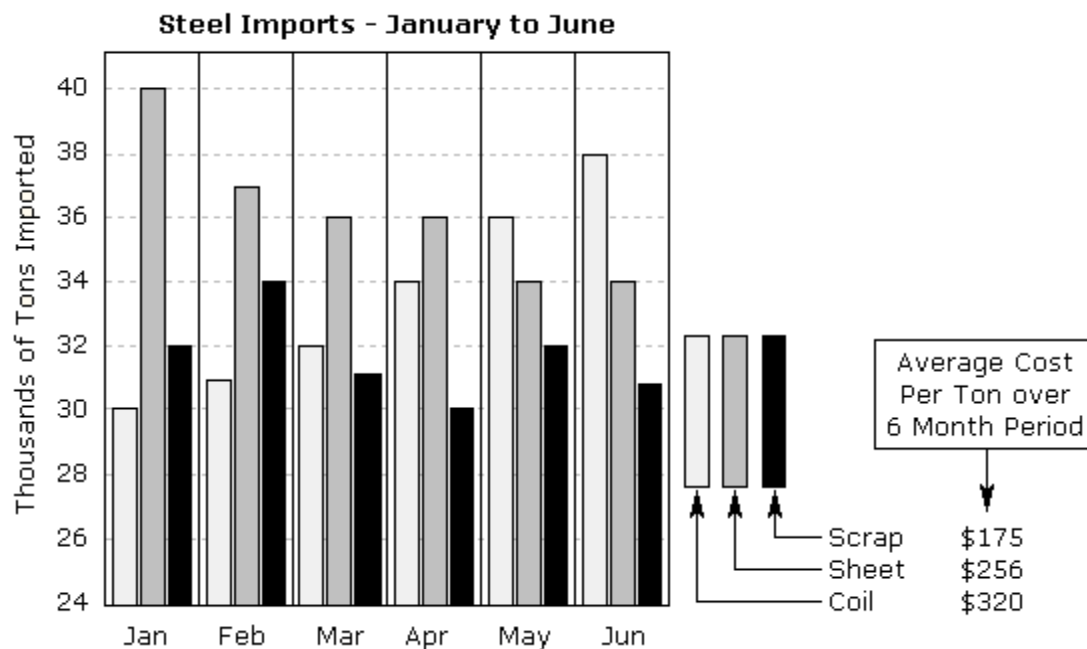
Note: 1. Answer all questions 2. All questions carry equal marks.

Maximum Marks: 60

Time: 2hrs.

1. What is the significance of Bibliography

2.

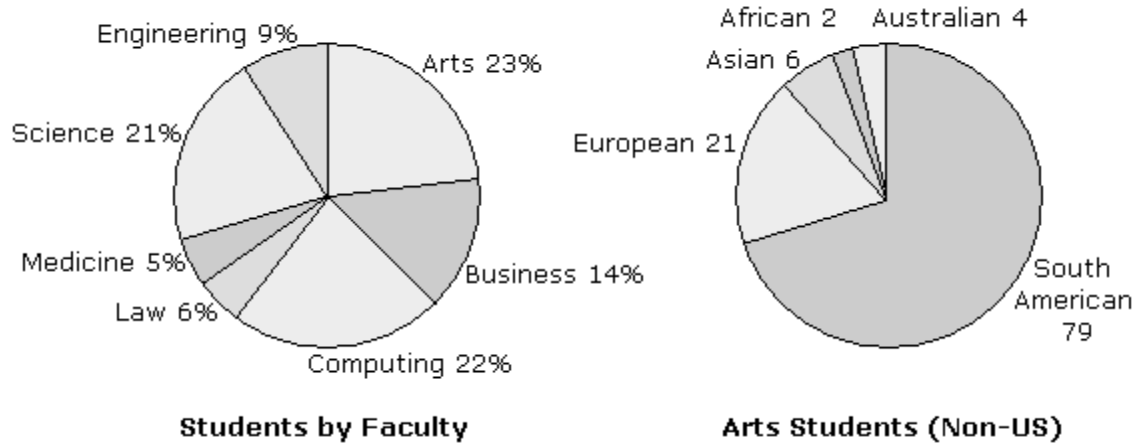


The figure above shows imports for three types of steel over a six month period. Use this information to answer the following questions.

a) Which month showed the largest decrease in total imports over the previous month?

b) What was the percentage of scrap steel imported in the 6 month & period ?

3.



The pie charts above show the percentage of students in each faculty at North West University and the number of non-US students in the Arts faculty. These percentages have been rounded to the nearest whole number. There are a total of 1049 students in the Arts faculty. Use this information to answer the following questions.

- How many students are there in the Engineering faculty?
- If six percent of Science students are Asian. How many Asian students are there studying Science?

4. If  $A = \begin{pmatrix} 2 & 0 & 1 \\ 0 & 2 & 0 \\ 1 & 0 & 2 \end{pmatrix}$ . Find eigen values of  $A$  and  $A^2$ .

5. Solve  $(1+x)^2 \frac{d^2 y}{dx^2} + (1+x) \frac{dy}{dx} + y = \sin(2 \log(1+x))$ .

6. State the relation between S.F. and B.M. and illustrate with an example.
7. Draw a simply supported beam and explain the support condition at each end of the beam.
8. Explain the term Shear Centre.
9. State and explain the principle of complementary shear.
10. Define Principal Stress and Principal Plane and how do you determine the max shear at a point.
11. Define the kern of a section.
12. Write the basic equation for finding out the Euler load of column.
13. Distinguish between static and kinematic indeterminacy.
14. State and explain Monte Carlo simulation technique and its usefulness in Structural Engg
15. How do you determine the system reliability from component reliability?
16. Distinguish between working stresses and limit state method of design philosophy.
17. Explain the term sensitivity with a suitable example.
18. Define viscosity and write the Newton's viscosity formula.
19. Define vapour pressure and mention the vapour pressure valve for water.
20. What is the principle of venturimeter and write the discharge equation for venturimeter.
21. State the Bernoulli's theorem and write the Bernoulli's equation.
22. Write the continuity equation for fluid flow.
23. Mention the various energy losses
24. Define Hydrology. What is meant by a hydrograph?
25. What is mass curve and its use.
26. Briefly mention the soil classification.
27. Write the Darcy's Law for flow through porous media.
28. How do you determine the vertical stress distribution due to point loads?
29. How do you determine the pre-consolidation pressure?
30. List out the soil equipment required for quality control.

**SYLLABUS FOR Ph.D. ENTRANCE EXAMINATION IN CIVIL ENGINEERING  
(2012-13)**

**GENERAL :**

Basic elements of Research Paper and Thesis

Computer knowledge on development of graphs bar charts and pi charts

Linear differential equations of higher order with constant coefficients – Cauchy, Legendre's homogeneous equations – simultaneous linear differential equations. Rank of a matrix – eigen values and eigen vectors – Cayley Hamilton theorem – quadratic forms. Correlation – coefficient of correlation – lines of regression – rank correlation.

**ANALYSIS:**

Stress, Principal stress and principal plane, bending stresses, shear stresses, Analysis of indeterminate structures moving loads matrix analysis of structures.

**DESIGN:**

Design of concrete beam, Slab; Design steel tension, compression and bending members connections.

Structural Reliability, Structural Dynamics, Theory of Elasticity.

**HYDRAULICS & WATER RESOURCES ENGINEERING:**

Fluid properties, Flow measurements, law of conservation of mass-momentum-energy, pipe flow, Hydrology, Reservoir Planning.

**GEOTECHNICAL ENGINEERING:**

Origin and formation Soils, Classification of Soils, Soil Hydraulics, Stress distribution, consolidation, compaction.