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CE - 304
B.E. III Semester
 Examination, June 2014
Engineering Geology
 www.rgpvonline.in
 Time : Three Hours

Maximum Marks : 70/100

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
 ii) All parts of each question are to be attempted at one place.
 iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
 iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Write notes on classifications of weathering. 2
- b) Discuss the composition of the earth crust. 2
- c) Discuss the atmosphere of the Earth. 3
- d) Discuss the importance of geology in the field of civil engineering. 7

OR

Describe the concept of earthquake. 7

Unit - II

2. a) Explain the term crystal and mineral with examples. 2
- b) Only mention the name, hardness of minerals. 2
- c) Explain the classification of rock forming minerals. 3

- d) Describe the main physical properties of minerals. 7
- OR

Distinguish between:-

- (i) Quartz and Calcite
- (ii) Mica and Telspor

Unit - III

- 3 a) Discuss the C.I.P.W classification of rocks. 2
- b) Explain porphyritic texture and paklite texture. 2
- c) Explain the term subhedral and anhedral forms. 3
- d) Describe the metamorphic textures and structures. 7

OR

Describe different rocks:-

- i) Granite ii) Basalt iii) Marble

Unit - IV

4. a) Explain the Dip and Strikes. 2
- b) Explain parts of folds. 2
- c) Draw a diagram of Horst and Garben. 3
- d) Describe the classification of faults (on the basis of Genesis). 7

OR

Describe the type of Unconformity. 7

Unit - V

5. a) Define the crushing strategic and Tensile strength. 2
- b) Describe on Artisian wells. 2
- c) Discuss the classification of DAM. 3
- d) Explain the geological classification of Dam site. 7

OR

Discuss the different types of water bearing structure. 7

[2]

OR

Evaluate the integral $\int_0^{\infty} \frac{\cos ax}{x^2+1} dx$. 7

2. a) Determine the Newton - Raphson iterative formula to find the k^{th} root of N. 2
- b) Find a real root of the equation $x \log_{10} x = 1.2$ by regula - falsi method correct to one decimal place. 2
- c) Find a real root of the equation $3x = \cos x + 1$ by iterative method correct to two decimal places. 3
- d) Apply Crout's factorization method to solve the system of equations: 7

$$\begin{aligned} x - y &= 0 \\ -2x + 4y - 2z &= -1 \\ -y + 2z &= 1.5 \end{aligned}$$

OR

Apply Gauss-Seidel iteration method to solve the system of equations: 7

$$\begin{aligned} 20x + y - 2z &= 17 \\ 3x + 20y - z &= -18 \\ 2x - 3y + 20z &= 1.5 \end{aligned}$$

3. a) Prove that: $e^x = \left(\frac{\Delta^2}{E} \right) e^x \cdot \frac{E e^x}{\Delta^2 e^x}$ 2
- b) Derive Newton's forward interpolation formula. 2
- c) Evaluate the integral $\int_0^{0.6} e^{-x^2} dx$ by Simpson $\frac{1}{3}$ rule. 3

[3]

- d) Apply Newton's divided difference formula to find the value of $f(9)$ from the following table: 7

x	5	7	11	13	17
f(x)	150	392	1452	2368	5202

OR

Find $\frac{dy}{dx}$ at $x=1.1$ from the following table: 7

x	1.0	1.2	1.4	1.6	1.8	2.0
y	0	0.128	0.544	1.296	2.432	4.000

4. a) Find by Taylor's series method the value $y(0.1)$ correct to three decimal places from the differential equation:

$$\frac{dy}{dx} = x^2 y - y, y(0) = 1. \quad 2$$

- b) Write the working rule of Runge-Kutta method of fourth order for the numerical solution of differential equation. 2

- c) If θ is the angle between the two regression lines show that: 3

$$\tan \theta = \frac{1-r^2}{r} \cdot \frac{\sigma_x \sigma_y}{\sigma_x^2 + \sigma_y^2}.$$

- d) Using modified Euler's method, find the value of $y(0.3)$ from the equation: 7

$$\frac{dy}{dx} = x + y, y(0) = 1.$$

OR