2015-2016
B.TECH. AUTUMN (III SEMESTER) EXAMINATION
(CIVIL ENGINEERING)
MATHEMATICS - III
[AM 311]
Credit - 04

Max Marks: 60
Duration: Three Hours

Note:
(i) Answer all questions.
(ii) Start each part from a new page.

1. (a) Find the directional derivative at (1, -2, 1) on sphere \( x^2 + y^2 + z^2 = 6 \) in the direction normal to the surface \( z = 2x^2 + y^2 - 5 \) at the same point.
(b) Show that \( \text{div} (\text{grad} \ f) = n (n+1) u^{n+2} \).
(c) Show that the vector field given by
\[
\vec{A} = (2xy + z^2)\hat{i} + (2yz + x^2)\hat{j} + (2xz + y^2)\hat{k}
\]
is irrotational. Find scalar function \( f \) such that \( \vec{A} = \text{grad} \ f \).

OR

(a') Find the value of \( n \) for which the vector \( \vec{r} \cdot \vec{F} \) is solenoidal, where, \( \vec{r} = x\hat{i} + y\hat{j} + z\hat{k} \).

2. (a) Evaluate \( \iint_S \vec{A} \cdot d\vec{S} \), where \( \vec{A} = yz\hat{i} + xz\hat{j} + xyk \) and \( S \) is the surface of sphere \( x^2 + y^2 + z^2 = 1 \) in the first octant.
(b) Use Green's theorem in a plane to evaluate the integral \( f \int_C \left( \frac{\partial}{\partial y} - \frac{\partial}{\partial x} \right) \left( x^2 + y^2 \right) dx + \left( x^2 + y^2 \right) dy \), where \( C \) is boundary in the xy plane of the area enclosed by X-axis and semi circle \( x^2 + y^2 = 1 \) in the upper half of XY-plane.

OR

(b') Verify Stokes' theorem for the function \( \vec{F} = x^2\hat{i} - xy\hat{j} \) integrated round the square in the plane \( z = 0 \) and bounded by the lines \( x = 0, y = 0, x = a \) and \( y = a \).

3. (a) If \( f(z) \) is an analytic function of \( z \) prove that \( \left( \frac{\partial^2}{\partial x^2} - \frac{\partial^2}{\partial y^2} \right) |f(z)|^2 = 2 \text{Re}(z) \overline{f}'(z)^2 \).
(b) If \( w = f(z) = u - iv \) and \( u = v - (x^2 + xy + y^2) \), Find \( w \) in terms of \( z \).
(c) Use Cauchy's integral formula to evaluate
\[
\int\frac{3z^2 + z}{z^2 + 1} \, dz,
\]
where \( C \) is circle \( |z| = 2 \).

Contd.......
4. (a) Form the partial differential equation by eliminating the arbitrary function from
the relation \( f(x y + z^2, x + y + z) = 0 \)

(b) A tightly stretched violin string of length \( l \) and fixed at both ends is plucked at
\( x = \frac{l}{3} \) and assumes initially the shape of a triangle of height \( a \). Find the
displacement \( y \) at any distance \( x \) and any time \( t \) after the string is released from
rest.

OR

(b') Show that the solution of differential equation \( \frac{\partial u}{\partial t} + k \frac{\partial^2 u}{\partial x^2} \), subject to the
conditions

(i) \( u \) not infinity for \( t \rightarrow \infty \)
(ii) \( \frac{\partial u}{\partial x} = 0 \) for \( x = 0 \) and \( x = l \)
(iii) \( u = l x - x^2 \) for \( t = 0 \) between \( x = 0 \) and \( x = l \) is

\[
   u = \frac{1}{6} \frac{\sigma^2}{\pi^2} \sum_{n=1}^{\infty} \frac{1}{n^2} e^{-\frac{\pi^2}{l^2} \sigma^2} \cos \frac{2\pi nx}{l}
\]

****
<table>
<thead>
<tr>
<th>Q.No.</th>
<th>Question</th>
<th>M.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(a)</td>
<td>What is the significance of heat of hydration? How is it determined in the laboratory?</td>
<td>[06]</td>
</tr>
<tr>
<td>1(b)</td>
<td>Discuss classification of aggregate based on their geological origin and size.</td>
<td>[06]</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1'</td>
<td>Write notes on the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(i) L.S. Sand</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(ii) Rapid hardening and low heat Portland cement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(iii) Soundness test on cement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(iv) Bulking of fine aggregate</td>
<td></td>
</tr>
<tr>
<td>2(a)</td>
<td>Define workability and also explain the factors affecting it.</td>
<td>[04]</td>
</tr>
<tr>
<td>2(b)</td>
<td>How the modulus of rupture of concrete is determined? Explain.</td>
<td>[04]</td>
</tr>
<tr>
<td>2(c)</td>
<td>Explain w/c ratio and curing of concrete</td>
<td>[04]</td>
</tr>
<tr>
<td>3(a)</td>
<td>Describe the classifications of bricks.</td>
<td>[06]</td>
</tr>
<tr>
<td>3(b)</td>
<td>Describe the tests performed to check the quality of bricks.</td>
<td>[06]</td>
</tr>
<tr>
<td>4(a)</td>
<td>Discuss the various defects in timber with neat diagram.</td>
<td>[06]</td>
</tr>
<tr>
<td>4(b)</td>
<td>What are the various tests on timber? Describe in detail the tests performed to determine moisture content and specific gravity of timber.</td>
<td>[06]</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4' (a)</td>
<td>What do you understand by preservation of timber? Describe the methods of preservation of timber.</td>
<td>[06]</td>
</tr>
<tr>
<td>4' (b)</td>
<td>Write short notes on the following.</td>
<td>[2x3=06]</td>
</tr>
<tr>
<td></td>
<td>(i) Plywood</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(ii) Block Board</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(iii) Fiber Board</td>
<td></td>
</tr>
<tr>
<td>5(a)</td>
<td>What is the use of glass in building construction? Describe the functions of constituents of glass.</td>
<td>[06]</td>
</tr>
<tr>
<td>5(b)</td>
<td>Define plastics. Describe the functions of constituents of plastics.</td>
<td>[05]</td>
</tr>
</tbody>
</table>
2015-16
B.TECH. (AUTUMN SEMESTER) EXAMINATION
CIVIL ENGINEERING
FLUID MECHANICS (CE-213)

Maximum Marks: 60
Credits: 04
Duration: Three Hours

Answer all the questions.
Assume suitable data if missing.
Notations used have their usual meaning.

<table>
<thead>
<tr>
<th>Q. No.</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(a)</td>
<td>Explain Newtonian and non-Newtonian fluids giving few examples of each. A steel plate with square base area weighing 320 N slides with a constant speed of 1.0 m/s on an inclined plane surface (4(\theta):3V). The gap between the plate and the surface is 2 mm and is filled with a lubricating oil (dynamic viscosity = 8 poise). Find the size of the plate.</td>
</tr>
<tr>
<td>1(b)</td>
<td>Explain local and convective accelerations. For a curved stream line show that the total tangential acceleration is given (a_t = \frac{\partial v}{\partial r} + v\frac{\partial \theta}{\partial \phi})</td>
</tr>
<tr>
<td>1(c)</td>
<td>If (u = 2xy^2) and (v = xy^2), check whether the flow is potential.</td>
</tr>
</tbody>
</table>

OR

| Q1′(a) | Differentiate between circulation and vorticity. If velocity distribution in a given flow field is defined as \(V = x^2\hat{y} - 2xy\hat{z} + 2\hat{k}\) Find (i) Acceleration along x-direction at P (1,1,1) and t=1 unit (ii) Rotation component along y-direction at Q(1,2,1) and t=2 units (iii) Vorticity along z-direction at R(1,2,3) and t=3 units |
| 1′(b)  | What is a flow net? What are its utilities? If velocity potential is defined as \(\phi = -x^2 - y^2 - \frac{z^2}{3}\) determine stream function \(\psi\). |

2(a) Classify manometers. For the manometer arrangement shown in Fig. 1 there is flow of water from A towards B. If the manometer reading \(h = 5\)cm, calculate the pressure difference \((p_A - p_B)\).

(b) A flash board is held in place by two stops as shown in Fig. 2. Determine the distance \(y\) between them so that the flash board will tumble when water reaches to 3m depth.

(c) Determine the magnitude and lines of action of horizontal and vertical components of force acting on radial gate shown in Fig. 3. The gate has 2m radius and 3m length into the paper.

Contd......2.
<table>
<thead>
<tr>
<th>Qn</th>
<th>Description</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2(a)</td>
<td>List the various forces that temporarily cause heeling of floating bodies.</td>
<td>12</td>
</tr>
<tr>
<td>(b)</td>
<td>A cylindrical buoy 2m in diameter and 1.5m in height weighing 12kN floats with its axis vertical in water ( \rho = 1020\text{kg/m}^3 ). Centre of gravity of buoy is 0.65 m above the bottom. If a cylindrical load of 2kN is placed on its top symmetrically, find the maximum height of centre of gravity of this load above the bottom if the buoy is to remain in just stable equilibrium.</td>
<td>10</td>
</tr>
<tr>
<td>(c)</td>
<td>An open cylindrical tank of diameter ( 2R ) and height ( H ) is completely filled with water with its axis vertical and is rotated about its axis at an angular velocity ( \omega ). Determine ( \omega ) such that the central portion of bottom of diameter ( R ) is exposed to atmosphere.</td>
<td>[marks missing]</td>
</tr>
<tr>
<td>Q3(a)</td>
<td>List out all assumptions of Bernoulli’s theorem. What is the value of energy correction factor for laminar and turbulent flows in closed conduits? Water is flowing through a siphon as shown in Fig. 4. Find the flow rate in the siphon. What is the pressure at point B? If minimum pressure allowable in the siphon is 70 kN/m² vacuum, what should be the maximum elevation of B above A.?</td>
<td>16</td>
</tr>
<tr>
<td>3(a)</td>
<td>What is momentum correction factor? What are its values for laminar and turbulent flows for pipes? For a two dimensional water jet deflected as shown in Fig. 5, determine the components of hydrodynamic force on the block.</td>
<td>35</td>
</tr>
<tr>
<td>3(b)</td>
<td>Write torque equation. For a frictionless shaft in the rotating sprinkler as shown in Fig. 6, equal discharge flows through each nozzle (relative velocities = 10 m/s), find the speed of rotation in rpm.</td>
<td>36</td>
</tr>
<tr>
<td>4(a)</td>
<td>Classify nozzles. Why an external cylindrical mouthpiece discharges more than an orifice having same diameter and working under same head?</td>
<td>03</td>
</tr>
<tr>
<td>(b)</td>
<td>A tank in the form of hemisphere having radius 2m is completely filled with water. It is to be emptied using an orifice of diameter 5cm fitted at its bottom. Determine the time of emptying if ( C_d ) is 0.62.</td>
<td>06</td>
</tr>
<tr>
<td>(c)</td>
<td>A 3.5m wide channel is to be provided with a contracted sharp crested weir of 1.2m height running free. If a maximum of 4 m³/s water discharge is to be passed over the weir with upstream depth not exceeding 2.25m, what should be the length of the weir? Also consider velocity of approach.</td>
<td>06</td>
</tr>
</tbody>
</table>

Contd.....3.
Note: Answer all questions.

1. Give detailed classification of rocks. Discuss important structural, textural features and uses of two rocks each from the three major rock groups. (12)

2. What do you understand by exogenous processes? What are the different agencies which carry out these works? Enumerate civil engineering aspect of this process. (12)

OR

2*. Discuss the classification and role of joints in engineering classification of rock mass. (12)

3. Define different types of aquifers. How water is distributed under the ground, explain with the help of a diagram. (12)

4. Give a brief account of earthquakes. Enumerate associated hazards. What are the methods and measures to mitigate the problems of earthquakes? (12)

OR

4*. Give a classification scheme for tunnels. Discuss important geomorphological and geological factors taken into consideration during designing and construction of the tunnels. (12)

5. Write short notes on any two of the followings:
   a. Physico-mechanical properties of rocks in construction industry (06)
   b. Rock Quality Designation (06)
   c. Terzaghi's Rock Load Theory (06)
   d. Unconformity (06)
B.TECH. EXAMINATION
CIVIL
Structural Mechanics CE 216
B. Tech. II (Civil) (Graduating Course)

Maximum Marks: 60
Credits: 04
Duration: Three Hours

Answer all the questions.
Assume suitable data, if missing.
Notations used have their usual meaning.

Q. No.

1(a) A masonry dam of trapezoidal section with 2m width at top and 7.5m wide at bottom with water face vertical is 10 m high and filled with 9m depth of water, keeping 1m free board. Calculate extreme stresses at base of the dam. Assume unit weight of masonry and water as 21 kN/m³ and 10 kN/m² respectively.

1(b) A cylindrical shell 3 m long, closed at the ends, has an internal diameter of 1 m and a wall thickness of 20 mm. Calculate the circumferential and longitudinal stresses induced and also change in the dimensions of the shell if it is subjected to an internal pressure of 1.5 MN/m². Take Young's modulus = 200 GPa and Poisson's ratio = 0.3

OR

1' Calculate force in members AB, BE, FE and BE of the cantilever frame shown in Fig. 1.

![Diagram of the cantilever frame]

10 kN 15 kN

4m

1.5m 1.5m

Fig. 1.

Contd.....2.
2. The principal stresses at points in a wall are given as follows.

\[ \sigma_{xx} = -30 \text{ N/mm}^2, \sigma_{yy} = 420 \text{ N/mm}^2 \text{ and } \tau_{xy} = 7 \text{ N/mm}^2. \]

Calculate stresses on a plane perpendicular to which is inclined to axis by 30° in clockwise direction. Also locate the principal planes and plane of maximum shear and calculate principal stresses.

3(a) A steel girder of 6 m length acting as a beam carries a uniformly distributed load \( w \) N/m run through its entire length. If \( T = 30 \times 10^6 \) m^4 and depth 270 mm, calculate:

(i) The magnitude of \( w \) so that the maximum stress developed in the beam section does not exceed 72 kN/m^2.

(ii) The slope at the support and deflection at the mid-span under this load.

3(b) A cantilever of span \( L \) is subjected to a uniformly varying load of intensity zero at the free end and \( w \) at the fixed end. Find slope and deflection at the free end of the cantilever using the method of double integration. Take flexural rigidity EI as uniform throughout.

OR

3' A horizontal beam rests on two supports at the same level and carries a uniformly distributed load on its entire span as shown in Fig. 2. Find the ratio of \( L_1 \) to \( L_2 \) if the deflection at the mid-span is equal to that at each end.

4. Using Castigliano's theorem, determine slope at support A and deflection at C for a simply supported beam as shown in Fig. 3. Assume \( E = 2 \times 10^5 \text{ N/mm}^2, I = 1 \times 10^6 \text{ mm}^4 \) and \( v = 0.3 \).
5(a) A cast iron hollow cylindrical column 4m in length when hinged at both the ends, has a critical buckling load of \( P \) kN. When the column is fixed at both the ends, its critical load rises to \( (P + 35000) \) kN. If the ratio of external diameter to internal diameter is 1.50 and \( E = 1.0 \times 10^5 \) N/mm\(^2\), determine the external diameter of the column.

5(b) Determine the ratio of the buckling strengths of a solid steel column to that of a hollow column of the same material and having the same cross-sectional area. The internal diameter of the hollow column is \( \frac{3}{4} \) of its external diameter. Both the columns are of the same length and are fixed at both ends.

5* A slender column is built-in at one end and an eccentric load is applied at the free end. Working from the first principles, find the expression for the maximum length of column such that the deflection of the free end does not exceed the eccentricity of loading.
2015-16
B.TECH. (AUTUMN SEMESTER) EXAMINATION
CIVIL ENGINEERING
SURVEYING I
CE 218

Maximum Marks: 60
Credits: 04
Duration: Three Hours

Answer all the questions.
Assume suitable data if missing.
Notations used have their usual meaning.

Q. No. Questions M. M.
1 (a) What are the principles of surveying? Explain. [04]
1 (b) A 20 m chain was found to be 15 cm too long after chaining a distance of 1600 m. It
was found to be 30 cm too long after chaining a distance of 3000 m. Determine the
correct distance if the chain was correct before the commencement of the work. [08]

OR

1' (a) What do you mean by reciprocal ranging? Explain. [04]
1' (b) To continue a survey line AB past an obstacle, a line BC 100 metres long was set out
perpendicular to AB, and from C angles BCD and BCE were set out at 60° and 45°
respectively. Determine the lengths which must be chained off along CD and DE in
order that ED may be in line AB produced. Also determine the obstructed length BH. [08]

2 (a) Briefly describe the process of orientation of plane table by back sighting method. [04]
2 (b) The following bearings were observed in running a closed traverse with a compass. [08]

<table>
<thead>
<tr>
<th>Line</th>
<th>Observed Bearings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Front bearing</td>
</tr>
<tr>
<td>AB</td>
<td>76° 05'</td>
</tr>
<tr>
<td>BC</td>
<td>114° 20'</td>
</tr>
<tr>
<td>CD</td>
<td>165° 35'</td>
</tr>
<tr>
<td>DE</td>
<td>224° 50'</td>
</tr>
<tr>
<td>EA</td>
<td>304° 50'</td>
</tr>
</tbody>
</table>

At what station(s) do you suspect local attractions? Determine the correct magnetic
bearings. If the magnetic declination was 3° 10' W, what are the true bearings? [04]

3 (a) Briefly explain the purpose of profile levelling and cross sectioning. [04]
3 (b) The following is the page of a field book. Fill in the missing readings and calculate the
R. L. of all the points. Apply usual checks. [08]

Contd...2.
<table>
<thead>
<tr>
<th>Station</th>
<th>Staff readings (m)</th>
<th>Rise (m)</th>
<th>Fall (m)</th>
<th>R. L. (m)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.150</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1.645</td>
<td></td>
<td></td>
<td></td>
<td>BM 1</td>
</tr>
<tr>
<td>3</td>
<td>2.345</td>
<td>0.500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>?</td>
<td>?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2.050</td>
<td>1.965</td>
<td>?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2.050</td>
<td>1.825</td>
<td></td>
<td>6.400</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1.590</td>
<td>?</td>
<td>0.120</td>
<td></td>
<td>BM 2</td>
</tr>
<tr>
<td>8</td>
<td>2.365</td>
<td>2.100</td>
<td>?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>?</td>
<td>?</td>
<td></td>
<td>452.250</td>
<td>BM 3</td>
</tr>
</tbody>
</table>

4 (a) Differentiate between loose and fast needle methods of theodolite traversing.
4 (b) A closed traverse was conducted round an obstacle and the following observations were made. Work out the missing quantities.

<table>
<thead>
<tr>
<th>Line</th>
<th>Length (m)</th>
<th>Azimuth</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB</td>
<td>500</td>
<td>98° 30'</td>
</tr>
<tr>
<td>BC</td>
<td>620</td>
<td>30° 20'</td>
</tr>
<tr>
<td>CD</td>
<td>468</td>
<td>298° 30'</td>
</tr>
<tr>
<td>DE</td>
<td>?</td>
<td>239° 00'</td>
</tr>
<tr>
<td>EA</td>
<td>?</td>
<td>150° 10'</td>
</tr>
</tbody>
</table>

OR

4' (a) Define tachometry. Explain the methods employed in tacheometric survey.
4' (b) Determine the gradient of a line AB with the following observations made with a tacheometer.

<table>
<thead>
<tr>
<th>Instrument station</th>
<th>Staff station</th>
<th>Horizontal angle</th>
<th>Vertical angle</th>
<th>Staff reading (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>A</td>
<td>0° 00' 00&quot;</td>
<td>10° 05' 20&quot;</td>
<td>2.585</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>40° 10' 30&quot;</td>
<td>0° 00' 00&quot;</td>
<td>3.100</td>
</tr>
</tbody>
</table>

Take constants of tacheometer as 100 and 0.

5 (a) Explain trapezoidal rule for the measurement of area by offsets from a base line.
5 (b) A series of perpendicular offsets were taken from a chain line to curved boundary:

<table>
<thead>
<tr>
<th>Chainage (m)</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset (m)</td>
<td>2.20</td>
<td>2.60</td>
<td>0.85</td>
<td>1.24</td>
<td>2.05</td>
<td>1.56</td>
<td>1.00</td>
<td>0.84</td>
</tr>
</tbody>
</table>

Determine the area between chain line and curved boundary by trapezoidal and Simpson's rule.
Maximum Marks: 50  
Credits: 04  
Duration: Three Hours

Answer all the questions.  
Assume suitable data if missing.  
Notations used have their usual meaning.

<table>
<thead>
<tr>
<th>Q.No.</th>
<th>Question</th>
<th>M.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(a)</td>
<td>Write the dimensions of Standard door, Standard Window and Clerestory and their Lintels.</td>
<td>6</td>
</tr>
<tr>
<td>1(b)</td>
<td>What is the purpose of Lintel?</td>
<td>02</td>
</tr>
</tbody>
</table>
| 1(c)  | Write the least dimensions of Front, Side and Rear Set Backs for a residential building in a plot size of:  
(i) Upto 250 m²  
(ii) 251 m² to 500 m²  
(iii) 501 m² to 1000 m² | 04 |

OR

1'(a)  | Draw the plan of a dog-legged stair case as per the following data:  
(i) Width of Stair Case = 2000 mm  
(ii) Length of Stair Case = 7000 mm  
(iii) Width of Tread = 300 mm  
(iv) Height of Riser = 150 mm  
(v) Horizontal Gap between the flights = 200 mm | 10 |

1'(b)  | Write the advantages of a dog-legged stair case | 02 |

2. | Determine the total number of standard bricks in superstructure, Plinth and Parapet wall for a single room as per the following data:  
(i) Width of Room = 3500 mm  
(ii) Length of room = 5000 mm  
(iii) Height of room = 4000 mm | 12 |

Contd...
(iv) Width of superstructure wall = One Brick
(v) Height of plinth = 1200 mm
(vi) Number of doors of standard size = 02 of standard size
(vii) Number of windows of standard size = 03
(viii) Number of clerestories of standard size = 03

3(a) What is the purpose of rate analysis? [04]
3(b) Analyse the rates for 25 cubic metre of Reinforced Cement Concrete in beams and slabs in the ratio of 1:2:4 [08]

OR

3' What is meant by Specifications and why they are necessary in construction work? [12]

4(a) What is DPC? Where and why it is provided? [03]
4(b) Write the least dimensions of:
   (i) Study Room
   (ii) Garage
   (iii) External Verandah
   (iv) Internal Verandah
   (v) Wash Room
   (vi) Kitchen [03]
   4(c) Write short notes on:
   (i) Quantity Survey and its Requirement (iii) Different areas in a Building [06]

5 (a) Define a Contract. What do you understand by free consent of parties? [06]
      (b) Write short notes on the following
      (i) Contract Document (ii) Administrative Approval [06]