Enrollment No......................................

Faculty of Engineering
End Sem (Even) Examination May-2018
FT3C009 Building Planning and Machine Drawing
Programme: B.Tech.   Branch/Specialisation: Fire Technology

Duration: 3 Hrs.   **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1   i.   The foundations are placed below ground level, to increase   **1**
          (a) Strength   (b) Workability
          (c) Stability of structure   (d) All of these

   ii.   The platform at the end of a series of steps, is known as   **1**
          (a) Platform   (b) Relief   (c) Rest   (d) Landing

   iii.   While designing a stair, the product of rise and going is   **1**
          approximately kept equal to
          (a) 350   (b) 420   (c) 450   (d) 500

   iv.   Pick up the correct statement from the following: **1**
          (a) Louvered door is generally provided in bath rooms
          (b) Flush door is generally provided in dinning room
          (c) Revolving door is generally provided in cinema halls.
          (d) Sliding door is generally provided in show room.

   v.   For effective drainage, the finished surface of flat roof should have   **1**
          a minimum slope of
          (a) 1 in 2   (b) 1 to 50   (c) 1 in 10   (d) 1 in 5.

   vi.   The ceiling height of a building is   **1**
          (a) Between ceiling and ground level
          (b) Between ceiling and floor level
          (c) Upto roof above ground level
          (d) Upto ceiling from the ground level.

   vii.   _____ is equal to the differences of the two limits of size of the part   **1**
          (a) Tolerance   (b) Low limit   (c) High limit   (d) Design size

viii. A positive allowance will always result in a _____ fit. **1**
(a) Clearance   (b) Interference
(c) Both (a) and (b)   (d) Any of these

ix. Leftmost element on a welding symbol is **1**
(a) Weld length   (b) Weld symbol
(c) Weld size   (d) Blank length

x. Length of bolt is specified as measured from **1**
(a) Top of head to end of bolt
(b) Bottom of head to end of bolt
(c) Where the threads starts to end
(d) Bottom of head to start of threads

Q.2   Attempt any two:

i. List different types of foundations? Explain any two with neat sketches. **5**

ii. Explain the classification of buildings into groups according to NBC with example. **5**

iii. Enlist the types of stairs. Explain dog-legged staircase with the neat sketch. **5**

Q.3   i. What are the aims of building drainage in a residential building? **4**

ii. Write down the classification of traps according to shape and use with diagrams. **6**

OR   iii. Explain types of sanitary appliances with the sketches. **6**

Q.4   i. Explain the following terms with sketches **4**
(a) Station point and vanishing point
(b) Horizontal plane and picture plane

ii. What is perspective view? Explain 1 point perspective and 2 point perspective with brief sketches. **6**

OR   iii. Draw the line plan of a residential building to be built in a plot area of 15 x 15 m^2 with a street of 6m in front of the plot facing South direction. Justify your placement of rooms in a few lines. **6**

Use minimum dimensions of rooms as per building byelaws. The plot should include the following -
(a) One Living room   (b) One Dining room + Kitchen
(c) One bedroom   (d) One Bathroom
(e) One WC   (f) Staircase

Q.5   i. Define Tolerance? **2**

ii. Calculate the limits, tolerances and allowances for a 20 mm shaft and hole pair designated H8 d8. **8**

The standard tolerance is given by in micron, $i = 0.45\sqrt[3]{D} + 0.001 D$

Where, D is mean diameter varies from 18 mm to 24 mm.
Tolerance grade 8 is 25i
The fundamental deviation for fit d is given by $FD = -16D^{0.44}$

OR   iii. A 50 mm diameter shaft rotate in a bush bearing. The tolerance for both shaft and the bearing is 0.050 mm and allowance is 0.10 mm. Find the dimensions of the shaft and the bearing on the hole basis system. **8**

Q.6   i. Define screwed fastening. Write any two example of temporary fastening. **2**

ii. Draw three views of a hexagonal-headed bolt, 35mm diameter and 150 mm long. Dimensions are for Hexagonal nut and bolt are given: **8**

Thickness of the nut,	T = D
Distance across diagonally opposite corners	2D
Angle of chamfer	30°
Radius of chamfer	R = 1.5D

OR   iii. Draw any four convention representation of welding joints and pipe joint. **8**

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Marking Scheme
FT3C009 Building Planning and Machine Drawing

Q.1   i.   The foundations are placed below ground level, to increase   1
       (c) Stability of structure

ii.   The platform at the end of a series of steps, is known as   1
       (d) Landing

iii.   While designing a stair, the product of rise and going is   1
approximately kept equal to
       (b) 420

iv.   Pick up the correct statement from the following: 1
       (c) Revolving door is generally provided in cinema halls.

v.   For effective drainage, the finished surface of flat roof should have   1
a minimum slope of
       (a) 1 in 20

vi.   The ceiling height of a building is   1
       (b) Between ceiling and floor level

vii.   _____ is equal to the differences of the two limits of size of the part   1
       (a) Tolerance

viii.   A positive allowance will always result in a _____ fit.   1
       (a) Clearance

ix.   Leftmost element on a welding symbol is   1
       (c) Weld size

x.   Length of bolt is specified as measured from   1
       (b) Bottom of head to end of bolt

Q.2   Attempt any two:

i.   Different types of foundation   3 Marks   5
       Explanation of any two in 30 words with diagram   2 Marks

ii.   All 9 group names with examples   5 Marks.   5

iii.   Different types of stairs   2.5 Marks   5
       Explanation of dog-legged with diagram   1.5 Marks.
       Diagram   1 Mark

Q.3   i.   Each aim of building drainage carry   1 mark   4
       (1 mark * 4)

ii.   Traps, if are classified according to shape with diagrams   6
       4 Marks;
       Traps, if are classified according to use then   2 Marks

OR   iii.   Names of any 6 sanitary appliances   3 Marks   6
       For sketches   3 Marks.

Q.4   i.   (a) Each term carry 1 Mark.   (1 mark * 2)   4
       (b) Each term carry 1 Mark.   (1 mark * 2)

ii.   Explanation of perspective view   2 Marks.   6
       Details of 1 point perspective   1 Mark
       Sketch carry   1 Mark
       2 point perspective   1 Mark
       Sketch carry   1 Mark

OR   iii.   For depicting plot with sides, facing of plot and street area   6
       (1 mark each)   3 Marks.
       One Living room and One Dining room + Kitchen, One bedroom
and One Bathroom, One WC and Staircase with dimensions on the
plot carries (1 mark each)   3 Marks.

Q.5   i.   Define Tolerance in 30 words.   2 Marks   2

ii.   Solution   8

D is mean diameter varies from 18 mm to 24 mm. There fore, the value of D is $(18 \times 24)^{1/2}$

D = 20.80 mm   **1Mark**

The standard tolereance unit is $i = 0.45\sqrt[3]{D} + 0.001\,D$

$i = 0.45\sqrt[3]{20.80} + 0.021$

$= 1.28$ micron   **1Mark**

For hole of quality 8, the standard tolerance, $25i = 0.032$ mm.

For the H hole the FD = 0

Hence the hole limit are 20 mm and 20 + 0.032 = 20.032 mm

Therefore, hole tolerance = 20.032 – 20 = .032 mm   **1Mark**

for shaft of quality 8, the standard tolerance = 25i = 25x 1.28 = 0.032 mm

for d shaft the FD

$FD = -16D^{0.44}$

$= -0.061$ mm   **1Mark**

Shaft limit

UL = 20.000 – 0.061 = 19.939 mm Ans **1Mark**

LL = 20- (0.061 + 0.032) = 19.907 mm Ans **1Mark**

Shaft tolerance = 19.939 – 19.907 = 0.032 mm Ans **1Mark**

Minimum allowance = 0.061 mm Ans **1Mark**

OR iii. solution 8

According tothe hole basis system lower limit of hole is the basic size.

LL of the hole = 50.00 mm ans. 2Marks

UL of the hole = 50.00 + tolerance
= 50.00 + 0.050
= 50.050 mm ans. 2Marks

we know that

allownce = LL of the hole – UL of the hole
= 50.00 – 0.10

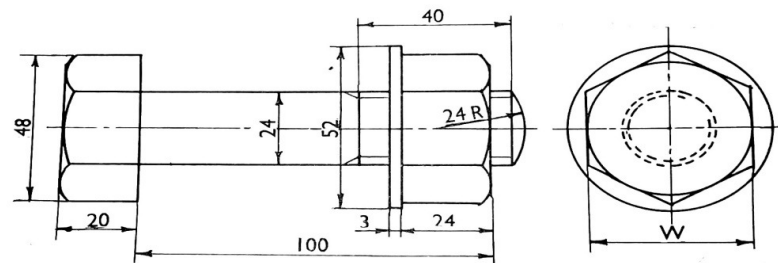HL of the shaft = 49.90 mm ans. 2Marks

LL of the shaft = 49.85 mm ans. 2Marks

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Q.6 i. Define screwed fastening. 1Marks 2

Write any two example of temporary fastening. 1Marks
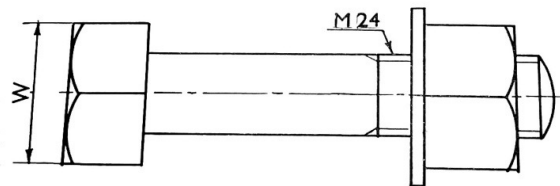
ii. diagram with neat dimensions 8

F View
3 marks

Side View
2 marks

T View
3 marks

OR iii. Four convention representation of welding joints 4 Marks 8

Four convention representation of pipe joints 4 Marks

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