Printed pages: 01 **Sub Code: NAR403**

Paper Id: **181246** **Roll No:** | | | | | | | | | | |

BARCH

(SEM IV) THEORY EXAMINATION 2018-19

ARCHITECTURAL STRUCTURES - IV

Time: 3 Hours ***Total Marks: 50***

Notes:

- *Attempt all Sections.*
- *Assume any missing data.*

SECTION – A

Q1) Answer all the following in brief: **(10X1=10)**

a) Explain under reinforced beam.
b) Define neutral axis.
c) Discuss the effective width of flange.
d) Define limit state method of design.
e) Define characteristic strength of concrete.
f) Draw stress-strain relationship for concrete in limit state method.
g) Define maximum depth of neutral axis.
h) Define development length.
i) Define partial safety factor.
j) Define shear reinforcement.

SECTION – B

Q2) Attempt any **five** questions: **(5x5=25)**

a) Differentiate between limit state method and working stress method and also discuss advantage of limit state method over working stress method.
b) A beam, simply supported over an effective span of 7m carries a live load of 20 kN/m. Design the beam, using M20 concrete and HYSD bars of grade Fe415. Keep width equal to half the effective depth. Assume unit weight of concrete as 25kN/m^3
c) A cross section of a single reinforced concrete beam is 300mm wide and 400mm deep. The reinforcement bars consist of 4-16mm diameter. If the stress in concrete and steel do not exceed 5N/mm^2 and 140 N/mm^2. Determine the moment of resistance of the section.
d) Discuss in brief various types of cements used for construction.
e) Differentiate between singly reinforced beam and doubly reinforced beam.
f) Write and explain design steps for doubly reinforced beams.
g) What do you understand by soil engineering? Discuss its advantages.
h) Differentiate between one-way and two-way slab.

SECTION – C

Q3) Attempt any **two** questions. **(2X7.5=15)**

a) Draw stress diagram of concrete and steel in limit state method of design and derive the resultant force acting on stress block.
b) A beam of effective span 8m carrying a u.d.l. of 18KN/m(factored) inclusive of self weight. Size of beam is 230mm X400 mm. Determine the reinforcement. Use M-20 concrete and fe415steel.
c) Design the reinforcement for a reinforced concrete beam 300mm wide and 400mm deep of grade M20 to resist an ultimate moment of 150kN-m, using mild steel bars of grade Fe250.

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