Total No. of Questions – [06] Total No. of Printed Pages: [2]

G.R. No.	

PAPER CODE	P122-215 PSE/ESE

May 2022 / INSEM+ENDSEM

F. Y. M. TECH. (Civil - Structures) (SEMESTER – II)

COURSE NAME: Design of RCC Bridges

COURSE CODE: CVPB12205A

(PATTERN 2020)

Time: [3 Hours] [Max. Marks: 60]

(*) Instructions to candidates:

1) **All Questions are compulsory**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**
5) **Use of IRC 06- 2017, IRC112-2011**

Q.1)a)What is impact factor in bridges? How it is calculated by using IRC6? (4)

Q.1) b)Calculate design moment for reinforced concrete slab culvert using following data , if additional data is required mention it clearly
i) clear span 5.5m ii) carriage way width 7.5m iii) width of bearing 450mm iv) wearing coat 80mm asphalt concrete v) Exposure condition : Moderate vi) live load : IRC class 70R tracked vehicle vii) Grade of steel FE 415 viii) kerb on either side : 600mm x300mm (6)

Q.2)a)Explain with sketch components of Tee beam bridges (5)

Q.2)b) Explain Courbon's method in Tee beam bridges (5)

Q.3) Explain step by step design procedure for rigid frame bridges in detail (10)

Q.4) Design a mild steel rocker bearing for transmitting the superstructure reactive load of 1100KN Assume following data a) Allowable pressure on bearing block : 3.8MPa b) Permissible bending stress : 165MPa c) Permissible bearing stress : 100MPa d) Permissible shear stress : 100Mpa , in addition to this assume suitable data if necessary for design and mention it clearly (10)

Q.5) The concrete gravity abutment / Wing wall of major bridge has following data a) width at top : 2.5m b) width at foundation level : 5.5 m c) Height of abutment / Wing wall : 4m d) Earth side is sloping and other side vertical e) Live load acting at center of top width : 27 KN f) safe bearing capacity of soil : 200KN/m^2 g) density of soil at site : 15KN/m^2 h) density of concrete : 25KN/m^2 i)Angle of internal friction of soil : 30 degree , Compute stresses developed at base and check stability of abutment / Wing wall also write your remark on stability of abutment / Wing wall in addition to this assume suitable data if necessary and mention it clearly (10)

Q.6)Explain with typical sketches various types of shapes of wells and reinforcement details in staining, well cap and bottom plug of well foundation (10)