

Roll No .....

**ES-220 (CE) (CBCS)****B.E. III Semester**

Examination, December 2017

**Choice Based Credit System (CBCS)****Material Science**

Time : Three Hours

Maximum Marks : 60

- Note: i) Attempt any five questions.  
ii) All questions carry equal marks.

1. a) Iron is basic construction material explain and write importance of steel in different form in construction work.  
b) Write and discuss the name of various non ferrous metals and their applications in construction work.  
c) Define: Metallic bonding, covalent bonding
2. a) What is a polymer? How does the structure of a polymer differ from that of a metal? Explain.  
b) Explain the mechanism of creep.  
c) Write the corrosion in brief and explain its importance in civil engineering projects.
3. a) Write the various test required for good quality stone and explain any two test in detail.  
b) Write the various steps of brick manufacturing process and explain in detail drying and firing.
4. a) What is water cement ratio in concrete also explain its effect on strength of concrete.  
b) Write the process for determining the initial and final setting time of cement in lab.

5. a) Define cement mortar, its functions and their quality.  
b) Write in brief on:  
i) Testing of concrete  
ii) Bulking of sand  
iii) Lime mortar
6. a) Write in short on various properties of reinforced steel for construction purposes.  
b) Write in brief on :  
i) Defects of timber  
ii) Particle board  
iii) Use of polymers  
c) Write short note on:  
i) Seasoning of timber  
ii) Common Indian timber
7. a) Write various tests of bitumen quality and explain any two in detail.  
b) Write short note on:  
i) Asphalt concrete  
ii) Use of asphalt in road construction  
iii) Asphalt flooring  
iv) Grades of bitumen
8. Write short note on (any five)  
i) Nano materials                      ii) Van der Waal bond  
iii) Fracture                              iv) Different bond in masonry  
v) Hardened concrete                  vi) Ply wood  
vii) Ceramic tiles                      viii) Cement

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