

**M.C.A. SEM - IV (CHOICE BASED CREDIT SYSTEM 2011 &
2012 COURSE) : SUMMER - 2018**
SUBJECT: PROBABILITY & SIMULATION

Day: **Thursday**
Date: **03/05/2018**

Time: **10.00 AM TO 01.00 PM**
Max. Marks: 100

S-2018-1799

N.B.:

- 1) Attempt any **FOUR** questions from Section –I and any **TWO** questions from Section –II.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer book.
- 4) Use of non- programmable **CALCULATOR** is allowed.

SECTION-I

- Q.1 a)** State and prove total probability theorem. **(07)**
- b)** Two unbiased dice are thrown simultaneously. Find the probability that **(08)**
- i) the sum of the scores on upper faces of dice is multiple of 3.
 - ii) the sum of the scores on upper faces of dice is a prime number.
- Q.2 a)** Define a random variable with a suitable example. **(07)**
- b)** A man draws 2 balls from a bag containing 5 white and 7 green balls. If he is to receive Rs. 22 for every white ball which he draws and Rs. 11 for every green ball which he draws . What is his expected income? **(08)**
- Q.3 a)** Explain Binomial distribution. **(07)**
- b)** Eight coins are thrown simultaneously. Find the probability of getting at least **(08)**
- i) six heads
 - ii) at most two heads.
- Q.4 a)** Explain normal distribution along with normal curve properties. **(07)**
- b)** In an intelligence test administered on 1000 students, the average score was 42 and standard deviation was 24. Find **(08)**
- i) the number of students whose score exceeds 50.
 - ii) the number of students whose score is lying between 30 and 54.
- Q.5** A bank counter window has a mean service time of 2 minutes and customers arrive at the rate of 20 per hour. By assuming that the arrival pattern follows Poisson distribution and service pattern follows exponential distribution, **(15)**
- i) what percent of time will the counter be idle?
 - ii) how long will it take for a customer to wait in the system?
 - iii) how many customers are waiting in the line?
- Q.6** Write short notes on any **THREE** of the following: **(15)**
- a) Central limit theorem
 - b) M/ M/1 queue model
 - c) Chi- square distribution
 - d) Simulation modeling

P. T. O.

