

M. Sc.**2017****2nd Semester Examination****BIO-MEDICAL LABORATORY SCIENCE AND MANAGEMENT****PAPER—BLM-202***Full Marks : 40**Time : 2 Hours**The figures in the right-hand margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**Illustrate the answers wherever necessary.**Answer question no.1 and any three from the rest.***1. Answer all questions of the following : 10×1***(Choose the right answer)*

- (a) Chains of immunoglobulin are held together by what ?
- (i) Hydrogen bonds.
 - (ii) Disulfide bonds.
 - (iii) Ionic bonds.
 - (iv) Van der Waals interactions.

(Turn Over)

- (b) In what region do antigens bind to immunoglobulin in an extremely specific manner :
- (i) Fab region.
 - (ii) Fc region.
 - (iii) Papain cleavage sites.
 - (v) Variable domain.
- (c) What consists of 2 alpha and 2 gamma chains :
- (i) Maternal haemoglobin.
 - (ii) HbA₁C.
 - (iii) HbF.
 - (iv) HbC.
- (d) What has the highest affinity for oxygen ?
- (i) Maternal Hb without 2,3-BPG.
 - (ii) HbS with 2,3-BPG.
 - (iii) Maternal Hb with 2,3-BPG.
 - (iv) HbF with 2,3-BPG.
- (e) Dacrocyte is :
- (i) anisocyte.
 - (ii) poikilocyte.
 - (iii) acanthocyte.
 - (iv) None.
- (f) Tris-EDTA-Borate combination is used in :
- (i) ESR.
 - (ii) Coagulation Factor determination.
 - (iii) Types of haemoglobin detection.
 - (iv) Sucrose lysis test.

- (g) Cytochrome P450 (CYPs) are proteins of the superfamily containing haeme as a cofactor and can be determined by :
- (i) Coulter Counter.
 - (ii) FACS.
 - (iii) HPLC.
 - (iv) Hb electrophoresis.
- (h) Which test does not monitor patient's coagulation ?
- (i) PT.
 - (ii) ACTH.
 - (iii) APTT.
 - (iv) FDP.
- (i) CD55 and CD59 are respectively known as :
- (i) DAF and protectin.
 - (ii) Protectin and DAF.
 - (iii) DAF and Membrane attack complex.
 - (iv) Membrane attack complex and DAF.
- (j) CPDA-1 used in blood banking is :
- (i) Citrate-phosphate-adenosine-1.
 - (ii) Citrate-phosphate-alanine-1.
 - (iii) Citrate-phosphate-adenine-1.
 - (iv) Citrate-phosphate-acetate-1.

2. (a) State the principle of electrical impedance for a coulter counting chamber.
- (b) What is the phenomenon of coincidence?
- (c) Diagrammatically represent and discuss the working mechanism of FACS.

3+2+5

3. (a) Discuss the genetic and molecular basis of sickle cell anaemia.
- (b) How do you detect it by cellulose-acetate electrophoresis?

6+4

4. (a) Discuss the role of T-form and R-form of haemoglobin in O_2 saturation.
- (b) How do you calculate the ability of a person to donate maximum amount of blood for blood banking?
- (c) What is platelet rich plasma and when this plasma is extensively required? What is apheresis?

3+2+(2+1+2)

5. (a) Discuss the role of red cell antigen conformational status with respect to determination of blood group.

- (b) Elaborate G-6-PD deficiency and write basic principle of the test for its detection.

4+(3+3)

6. (a) What is haptoglobin ?

(b) Write the causes of development of hemophilia.

(c) Why PNH red cells are susceptible to lysis by complement ?

(d) State the different steps of blood coagulation cascade.

2+2+2+4
