2014
M.Sc.
1st Semester Examination
BIO-MEDICAL LABORATORY SCIENCE & MANAGEMENT
PAPER—BLM-102
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 Q. No. 1 and any three questions from the following.

1. Answer any ten of the following : 1x10
   (a) What is standard?
   (b) Define GLP.
   (c) What do you mean by false negative result?
   (d) What is reproglucibility?
   (e) Write the full form of PERT.
   (f) What do you mean by Critical path merge?
   (g) Who are the customer for a biomedical laboratory?
   (h) What is the thumb rule of quantitative qualitative analysis?

(Turn Over)
(i) Reject the result when 1 control measurement in a group exceeds the mean +2S and other exceeds mean −2S denotes:
   (i) $R_4$ ;
   (ii) $R_4$ ;
   (iii) 4Rs ;
   (iv) $R_4$ .

(j) N in multirule QC procedure denotes:
   (i) The mean number of control measurement available at the time a decision on control status;
   (ii) The mean number of standard measurement available at the time a decision on control status;
   (iii) Both (i) and (ii) ;
   (iv) None of the above.

(k) Scraps in QC means:
   (i) Rejected data of a laboratory ;
   (ii) Rejected results of a laboratory ;
   (iii) Rejected papers of a laboratory ;
   (iv) Rejected reagents of a laboratory.

(l) Systematic Errors can be detected most efficiently by:
   (i) Levy Henning plot ;
   (ii) Cusum Chart ;
   (iii) Westguard rule ;
   (iv) All of the above.

(m) 'Out of Control':
   (i) Reject the test values and do not report patient ;
   (ii) Reject the control values and do not report patient ;
   (iii) Reject Blank values and do not report patient ;
   (iv) None of the above.
(n) Pipetting of dH₂O should be done with:
   (i) Index finger only;
   (ii) Index finger with high surface area;
   (iii) Thumb finger only;
   (iv) Thumb finger only with high surface area.

(o) Communication between workers and authority should be:
   (i) Undirectional;
   (ii) Bidirectional;
   (iii) Multidirectional;
   (iv) None of the above.

2. (a) Control 1 has a mean of 200 mg/dL with SD = 4.0
Control 2 has a mean of 250 mg/dL with SD = 5.0
Prepare Control Charts and interpret results on the basis of 1₂S and 1₃S Rule violation of the following data:

<table>
<thead>
<tr>
<th>Day</th>
<th>Control 1</th>
<th>Control 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>200</td>
<td>247</td>
</tr>
<tr>
<td>2</td>
<td>205</td>
<td>250</td>
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<td>3</td>
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<td>6</td>
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<td>196</td>
<td>239</td>
</tr>
<tr>
<td>10</td>
<td>207</td>
<td>236</td>
</tr>
</tbody>
</table>

(b) What is PDCA cycle? Show diagrammatically.

8+2
3. (a) The following haemoglobin level detected from blood by using following Newly prepared reagent and stock reagent:

Hb(gm/dL) Newly Prepared — 
11, 11.5, 11, 11, 10.5, 11.5

Hb(gm/dL) Stock Reagent — 
10, 11, 12, 11, 11, 13

Identify if any error is here and interpret your result.

(b) How do you make the team for a TQM system?

(c) Briefly describe the procedure of control serum preparation. 5+2+3

4. (a) In a group of patients presenting to a hospital emergency with abdominal pain, 30% of patients have acute appendicitis, 70% of patients with appendicitis have temperature greater than 37.5°C and 40% of patients without appendicitis have a temperature greater than this.

Calculate sensitivity and specificity.

(b) How do you calibrate a micropipette?

(c) What do you mean by external failure cost?

\[ (2\frac{1}{2} + 2\frac{1}{2})+3+2 \]

5. (a) Describe different types of error arises in a laboratory and how will you rectify it.

(b) Describe briefly interlaboratory programmes with special reference to proficiency testing. 5+5

6. (a) What is cost benefit analysis?

(b) Explain the criteria of NPV, BCR and IRP of cost benefit analysis.

(c) Describe briefly the types of bio-medical laboratory on the basis of infrastructure and work facilities. 1+5+4