



PAST PAPERS

<i>Faculty</i> Not Applicable	<i>Department / Section/Division</i> Learning Resource Centre
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**Past Papers**

Faculty of Health Sciences

**General Papers**

**(Year 3 – Semester 2)**

<i>Document Control &amp; Approving Authority</i>	<i>Senior Director – Quality Management &amp; Administration</i>
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<i>1<sup>st</sup> Issue Date: 2017.011.30</i>	<i>Revision No.00</i>	<i>Revision Date: 18.09.2024</i>	<i>Validated by: Librarian</i>
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10 JUL 2024



**Faculty of Health Sciences**  
**Bachelor of Science (Honours) in Biomedical Sciences/ Bachelor of Science**  
**(Honours) in Industrial Pharmaceutical Sciences/ Bachelor of Science (Honours)**  
**in cosmeceutical Sciences**  
**IPS 3243/BMS 3243/BCS 3244**

**Ethics, Research Methodology and Statistics**  
**3<sup>rd</sup> Year 2<sup>nd</sup> Semester-Batch 05**  
**End Semester SEQ Examination**

Date : 07.06.2024  
 Time : 9.00 A.M – 12.00 P.M (3 HOURS)

**INSTRUCTIONS TO CANDIDATES**

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink

**QUESTION 01**

**(100 Marks)**

1.1 Define the term of Scientific research.

**(10 marks)**

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1.2 Mention the basic operations of the systematic research.

**(20 marks)**

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1.3 Compare and contrast the types of data used for the research with an example. **(30 marks)**

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1.4 What is meant by scientific misconduct in ethical consideration?

**(40 marks)**

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**QUESTION 02**

**(100 marks)**

The Finance Department of company 'X' is analyzing the annual performance scores of the employees, based on the duration of the service to the company. The three groups were prepared based on the duration of the service: Short (Less than 1 year), middle (1-5 years) and long (more than 6 years). The finance department is required to check whether category long has performed well in the annual performance evaluation.

Apply 5% significant level.

Category	Short	Middle	Long
Sample size	15	12	15
Mean	65	75	80
Standard Deviation	1.5	2.2	5.3

2.1. Mention the null and alternative hypothesis.

(20 marks)

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2.2. Calculate the grand mean for the above data.

(20 marks)

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2.3. Complete the following table based on the provided information and Find the F value.

(45 marks)

Source	SS	df	MS	F
Between	1740.1722			
Within				
Total	2218.1722			

2.4. State the conclusion.

(15 marks)

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**QUESTION 03**

**(100 Marks)**

A repair worker required to estimate the cost of repairing one vehicle that was on the garage. He plans to repair 25 cars, and the average repair is \$10,000. The standard deviation of the 25-car sample is \$2,000.

3.1. Find the table value of 98% confidence interval.

(20 marks)

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3.2. Calculate true mean cost of repair as a range.

(40 marks)

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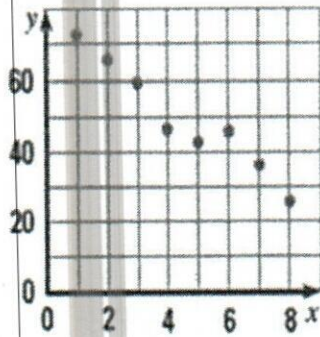


**QUESTION 06**

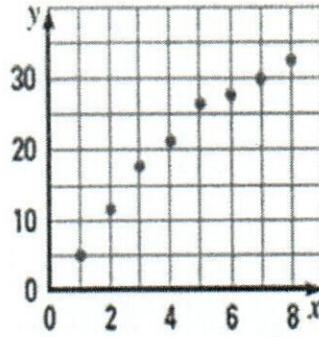
(100 Marks) 00067

6.1 Describe the correlation represented by each scatter plot.

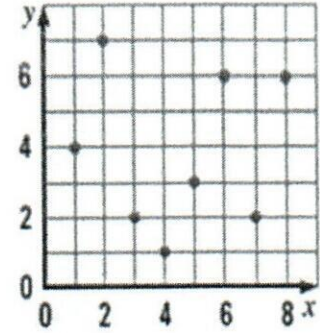
(30 marks)



a



b



c

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6.2 Comment on the analysis of following SPSS output.

(40 marks)

**Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
v	.231	5	.200 <sup>*</sup>	.881	5	.314

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

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## T-Table

## t-test table

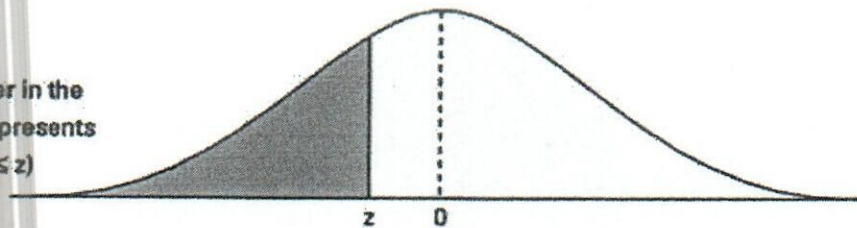
cum. prob	$t_{.50}$	$t_{.75}$	$t_{.80}$	$t_{.85}$	$t_{.90}$	$t_{.95}$	$t_{.975}$	$t_{.99}$	$t_{.995}$	$t_{.999}$	$t_{.9995}$
one-tail	0.50	0.25	0.20	0.15	0.10	0.05	0.025	0.01	0.005	0.001	0.0005
two-tails	1.00	0.50	0.40	0.30	0.20	0.10	0.05	0.02	0.01	0.002	0.001
df											
1	0.000	1.000	1.376	1.963	3.078	6.314	12.71	31.82	63.66	318.31	636.62
2	0.000	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	22.327	31.599
3	0.000	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	10.215	12.924
4	0.000	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	0.000	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	0.000	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	0.000	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	0.000	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	0.000	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	0.000	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	0.000	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	0.000	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	0.000	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	0.000	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	0.000	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	0.000	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	0.000	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	0.000	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	0.000	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	0.000	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	0.000	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	0.000	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	0.000	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.485	3.768
24	0.000	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	0.000	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	0.000	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	0.000	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.421	3.690
28	0.000	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	0.000	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.396	3.659
30	0.000	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.385	3.646
40	0.000	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.307	3.551
60	0.000	0.679	0.848	1.045	1.296	1.671	2.000	2.390	2.660	3.232	3.460
80	0.000	0.678	0.846	1.043	1.292	1.664	1.990	2.374	2.639	3.195	3.416
100	0.000	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.174	3.390
1000	0.000	0.675	0.842	1.037	1.282	1.646	1.962	2.330	2.581	3.098	3.300
z	0.000	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.090	3.291
	0%	50%	60%	70%	80%	90%	95%	98%	99%	99.8%	99.9%
	Confidence Level										







Number in the  
table represents  
 $P(Z \leq z)$



z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-3.6	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
-3.5	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
-3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
-3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
-3.2	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
-3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
-3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
-2.9	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
-2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
-2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
-2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
-2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
-2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
-2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
-2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
-2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
-2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
-1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
-1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
-1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
-1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
-1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
-1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
-1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
-1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
-1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
-1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
-0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
-0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
-0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
-0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
-0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
-0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
-0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
-0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
-0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
-0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641



F-Table

		F-table of Critical Values of $\alpha = 0.05$ for $F(df_1, df_2)$																		
		DF1=1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	$\infty$
DF2=1		161.45	199.50	215.71	224.58	230.16	233.99	236.77	238.88	240.54	241.88	243.91	245.95	248.01	249.05	250.10	251.14	252.20	253.25	254.31
2		18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.40	19.41	19.43	19.45	19.45	19.46	19.47	19.48	19.49	19.50
3		10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55	8.53
4		7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63
5		6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40	4.37
6		5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	3.67
7		5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	3.23
8		5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	2.93
9		5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	2.71
10		4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58	2.54
11		4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	2.40
12		4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34	2.30
13		4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25	2.21
14		4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18	2.13
15		4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11	2.07
16		4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06	2.01
17		4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01	1.96
18		4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97	1.92
19		4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	1.88
20		4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90	1.84
21		4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81
22		4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84	1.78
23		4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81	1.76
24		4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79	1.73
25		4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77	1.71
26		4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.22	2.15	2.07	1.99	1.95	1.90	1.85	1.80	1.75	1.69
27		4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.20	2.13	2.06	1.97	1.93	1.88	1.84	1.79	1.73	1.67
28		4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24	2.19	2.12	2.04	1.96	1.91	1.87	1.82	1.77	1.71	1.65
29		4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.18	2.10	2.03	1.94	1.90	1.85	1.81	1.75	1.70	1.64
30		4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.09	2.01	1.93	1.89	1.84	1.79	1.74	1.68	1.62
40		4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08	2.00	1.92	1.84	1.79	1.74	1.69	1.64	1.58	1.51
60		4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	1.99	1.92	1.84	1.75	1.70	1.65	1.59	1.53	1.47	1.39
120		3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.83	1.75	1.66	1.61	1.55	1.50	1.43	1.35	1.25
$\infty$		3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88	1.83	1.75	1.67	1.57	1.52	1.46	1.39	1.32	1.22	1.00



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**Faculty of Health Sciences**  
**B.Sc. (Hons) Biomedical Sciences/B.Sc. (Hons) Industrial Pharmaceutical Sciences/**  
**B.Sc. (Hons) Cosmetic Science**  
**Pharmacology II / Cosmetic Pharmacology II**  
**IPS3213 / BCS 3213 / BMS 3213**  
**3<sup>rd</sup> Year 2<sup>nd</sup> Semester**  
**Batch 05**  
**End Semester SEQ Examination**

**Date: 03<sup>rd</sup> June 2024**

**Time: 09.00 am – 12.00 pm – Three Hours**

**INSTRUCTIONS TO CANDIDATES**

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.

**Question 01**

**(100 Marks)**

**Describe the mode of action of,**

a. Metformin,

**(25 Marks)**

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b. Sitagliptin,

**(25 Marks)**

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c. Glipizide,

**(25 Marks)**

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d. Carbimazole,

**(25 Marks)**



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**Question 02**

**(100 Marks)**

2.1. What are the adverse effects of anticancer drugs?

**(40 Marks)**

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2.2 List two antibiotics used as cytotoxic drugs,

**(20 Marks)**

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2.3 Briefly indicate the pharmacological effects of Tamoxifen in breast carcinoma,

**(20 Marks)**

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2.4 Name two examples for group B targeted cytotoxic drugs,

**(20 Marks)**

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**Question 03**

**(100 Marks)**

3.1 What is the mode of action of oestrogen?

**(30 Marks)**

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3.2 List the clinical uses of oestrogen and its products,

**(10 Marks)**

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3.3 Name differences between combined pill and mini pill,

**(40 Marks)**

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3.4 What are the precautions you would like to consider during dispensing the combined oral contraceptive pills?

**(30 Marks)**

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**Question 04**

**(100 Marks)**

4.1 List the drug preparations used for dermatological treatments,

**(25 Marks)**

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4.2 What is a barrier preparation?

**(10 Marks)**

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4.3 What are the clinical uses of emollient?

**(20 Marks)**

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4.4 List topical antifungals used in clinical practice,

**(20 Marks)**

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4.5 List the stepwise drug management of acne,

**(25 Marks)**

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**Question 05**

**(100 Marks)**

5.1 Classify the types of migraine,

**(20 Marks)**

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5.2 Name the drugs used for acute migraine.

**(20 Marks)**

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5.3 What is the mode of action of one drug you mentioned in 5.2.?

**(25 Marks)**

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5.4 What is meant by prophylaxis?

**(20 Marks)**

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5.5 List the drugs used for prophylaxis of migraine.

**(15 Marks)**

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**Question 06**

**(100 Marks)**

6.1 What is the mode of action of Benzodiazepine?

**(20 Marks)**

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6.2 List the clinical uses of benzodiazepines,

**(10 Marks)**

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6.3 List one example for short-acting intermediate-acting and long-acting benzodiazepines,

**(30 Marks)**

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6.4 List the drug groups used for anxiety,

**(20 Marks)**

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6.5 What is the difference between a major analgesic and a minor analgesic?

**(20 Marks)**

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**Faculty of Health Sciences****Bachelor of Science Honours in Biomedical Science/ Bachelor of Science Honours in Industrial Pharmaceutical Science/ Bachelor of Science Honours in Cosmetic Science****BMS 3213/CS 3213/IPS 3213 Pharmacology II****3<sup>rd</sup> Year 2<sup>nd</sup> Semester****End Semester SEQ Examination****4<sup>th</sup> Batch**

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Date : 04<sup>th</sup> September 2023  
Time : 09.00 a.m. – 12.00 p.m. (Three Hours)

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**INSTRUCTIONS TO CANDIDATES**

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are not allowed to take out the examination papers.

**Question 01**

- 1.1. Describe the clinical uses of Benzodiazepine (30 marks)
- 1.2. Describe action of general anesthetics (30 marks)
- 1.3. Name the drugs used for the induction of anesthesia (20 marks)
- 1.4. State two drugs used to local anesthesia (20 marks)

**Question 02**

- 2.1. Write an account on first and second generation antidepressants (25 marks)
- 2.2. What are the advantages of second generation drugs over first generation? (25 marks)
- 2.3. List the drugs for antipsychotics and clinical uses (25 marks)
- 2.4. Compare two generations of antipsychotics (25 marks)



**Question 03**

- 3.1. What are the two types of commercial thyroxine available in the market? (20 marks)  
3.2. What is your advice to patient taking thyroxine? (20 marks)  
3.3. Describe mode of action of one anti-thyroid drug (25 marks)  
3.4. List the examples for NSAID in relieving inflammation and briefly indicate the site of action (35 marks)

**Question 04**

- 4.1 Describe drugs used in acne (25 marks)  
4.2. Name two keratolytics used in Dermatology treatment (25 marks)  
4.3. List the antibiotics used in the dermatology (25 marks)  
4.4. List the types of steroids used in dermatitis (25 marks)

**Question 05**

- 5.1. What are the clinical uses testosterone preparations? (25 marks)  
5.2. List two adverse effects of above (20 marks)  
5.3. Indicate types of immunomodulators (30 marks)  
5.4. Describe the mode of action of one group you mentioned in 5.3 (25 marks)

**Question 06**

6. Describe the,  
6.1. difference between Soluble insulin and insulin glargine (25 marks)  
6.2. metformin (25 marks)  
6.3. action of Sitagliptin (25 marks)  
6.4. side effects and storage of insulin (25 marks)



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**Faculty of Health Sciences**  
**Bachelor of Science (Honours) in Biomedical Sciences/ Bachelor of Science**  
**(Honours) in Industrial Pharmaceutical Sciences/ Bachelor of Science**  
**(Honours) in cosmeceutical Sciences**

**Ethics, Research Methodology and Statistics**  
**BMS/IPS/CS 3244**

**3<sup>rd</sup> Year 2<sup>nd</sup> Semester**  
**Batch 04**

**End Semester SEQ Examination**

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**Date: 13<sup>th</sup> of September 2023**  
**Time: 09.00 am – 12.00 pm (Three Hours)**

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**INSTRUCTIONS TO CANDIDATES**

- This question paper consists of **SIX** questions.
  - Answer **ALL** questions.
  - You should write legibly in black or blue ink
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**Question 01** **(100 Marks)**

1.1. What is "sample"? (10 marks)

1.2. Compare the qualitative and quantitative data. (20 marks)

1.3. Write two examples for each data type mentioned below.  
Nominal, ordinal, ratio and interval (30 marks)

1.4. Briefly explain two probability sampling methods.. (40 marks)

**Question 02** **(100 Marks)**

2.1. Comment on the analysis of following SPSS output with the developed hypothesis for the test. (30 marks)



## Tests of Normality

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
v	.231	5	.200*	.881	5	.314

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

2.2. A Biomedical scientist expected to do a toxicity analysis experiment using fish as trial organisms with a drug to be tested. He tested the mortality percentage of the fish after 24 hours of exposure with relevant to different concentrations of test drug in  $\mu\text{g/L}$ . A linear regression analysis was run from SPSS software package, for a collected dataset.

2.2.1. Define the dependent and independent variables. (20 marks)

2.2.2. Comment on the following analysis results of regression analysis. (50 marks)

Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.942 <sup>a</sup>	.888	.877	5.33791

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	47.333	3.774		12.540	.000
	concen_drug	.613	.069	.942	8.900	.000

## Question 03

(100 Marks)

3.1. A lecturer wanted to compare the scores for the module "Ethics, Research Methodology and Statistics" in two batches of CINEC students to analyze whether the mean score in two batches are significantly different or not.

3.1.1. What is the statistical test that she should perform to analyze the results? (20 marks)

3.1.2. Construct the hypotheses for the test that you mentioned in 3.1.1. (20 marks)

3.1.3. If she got a p value of 0.065 by performing the test that you mentioned in 3.1.1; what should be her conclusion on marks of two batches of students? (20 marks)

3.2. State the **ONE** research ethic per each of following.

3.2.1. When conducting a drug testing with wistar rats

3.2.2. When publishing a manuscript

3.2.3. When giving authorships for a final research paper

3.2.4. When reviewing a manuscript as a reviewer (40 marks)



**Question 04****(100 Marks)**

4.1. A university is analyzing the performance of the students, based on the duration of the study for the module of statistics. The three groups were prepared based on the time spent on studying daily; low (Less than 1 hour), middle (less than 5 hours) and high (less than 12 hours). University is required to check whether category high perform well during the examination.

Apply 5% confidence interval.

Category	Low	Middle	High
Sample size	7	9	8
Mean	75.71	75.71	75.71
Standard Deviation	17.63	17.63	17.63

4.1.1. Mention the null and alternative hypothesis. (20 marks)

4.1.2. Complete the following table based on the provided information and Find the F value. (60 marks)

Source	SS	df	MS	F
Between	1902			
Within				
Total	5288			

4.1.3. State the conclusion. (20 marks)

**Question 05****(100 Marks)**

5.1. What are the steps of scientific method? (20 marks)

5.2. Mention FRIENDS framework on developing a good research topic. (20 marks)

5.3. List five characteristics of a good hypotheses. (20 marks)

5.4. A researcher is conducting an experiment to find whether a plant extract A has better antimicrobial property over the commercially available soap (B). Write the null and alternative hypothesis for the above research question? (40 marks)

**Question 06****(100 Marks)**

6.1. State the basic 3 types of Epidemiological study designs (30 marks)

6.2. Briefly describe the following diagrams regarding the epidemiological studies (20 marks)

6.3. Briefly describe the Retrospective Cohort Study according to the timeline (30 marks)

6.4. State two types of data summarization methods for each the followings (20 marks)

6.4.1. Numerical Summaries

6.4.2. Graphical Summaries



## Annexure

F-table of Critical Values of $\alpha = 0.05$ for $F(df1, df2)$																			
	DF1=1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	$\infty$
DF2=1	161.45	199.50	215.71	224.58	230.16	233.99	236.77	238.88	240.54	241.88	243.91	245.95	248.01	249.05	250.10	251.14	252.20	253.25	254.31
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.40	19.41	19.43	19.45	19.45	19.46	19.47	19.48	19.49	19.50
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55	8.53
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40	4.37
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	3.67
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	3.23
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	2.93
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	2.71
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58	2.54
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	2.40
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34	2.30
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25	2.21
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18	2.13
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11	2.07
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06	2.01
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01	1.96
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97	1.92
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	1.88
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90	1.84
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84	1.78
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81	1.76
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79	1.73
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77	1.71
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.22	2.15	2.07	1.99	1.95	1.90	1.85	1.80	1.75	1.69
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.20	2.13	2.06	1.97	1.93	1.88	1.84	1.79	1.73	1.67
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24	2.19	2.12	2.04	1.96	1.91	1.87	1.82	1.77	1.71	1.65
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.18	2.10	2.03	1.94	1.90	1.85	1.81	1.75	1.70	1.64
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.09	2.01	1.93	1.89	1.84	1.79	1.74	1.68	1.62
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08	2.00	1.92	1.84	1.79	1.74	1.69	1.64	1.58	1.51
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	1.99	1.92	1.84	1.75	1.70	1.65	1.59	1.53	1.47	1.39
120	3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.83	1.75	1.66	1.61	1.55	1.50	1.43	1.35	1.25
$\infty$	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88	1.83	1.75	1.67	1.57	1.52	1.46	1.39	1.32	1.22	1.00